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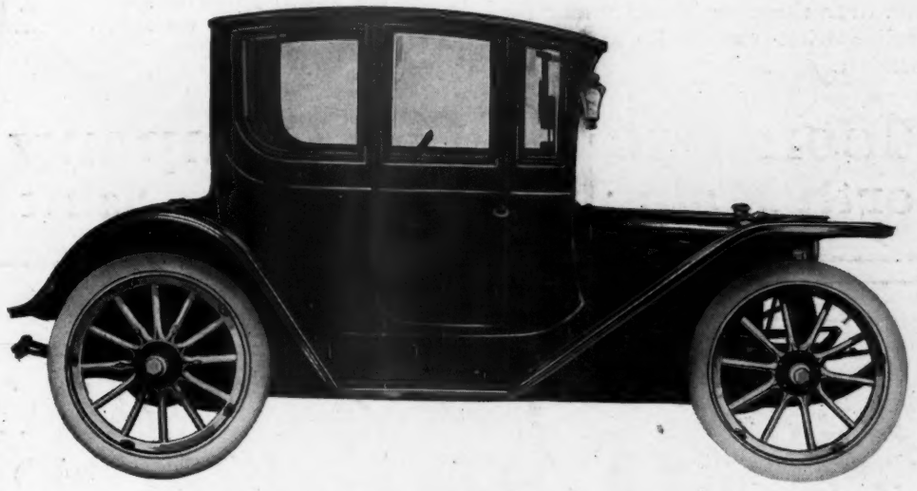
MOTOR AGE

VOLUME XXII CHICAGO, OCTOBER 24, 1912 NUMBER 17

Positive proof of the growing popularity of the Underslung construction.

Actual sales last fiscal year over preceding year—gain 183 per cent.
Actual sales first two months this year over same last year—gain 175 per cent.



Self **AMERICAN UNDERSLUNG** *Starting*

The "American Scout Coupe" $2,000
Fully Equipped

Three passengers. Motor, four cylinders, 4 inch bore, 5 inch stroke, "T" head, cast en bloc. Wheel base, 105 inches; tires 37x4 inch, front and rear on demountable rims.

Ignition, dual system; Eiseman magneto and storage battery; transmission, sliding selective type, three speeds and reverse; rear axle, full floating, pressed steel differential housing and axle tubes integral.

Regular equipment: electric light generator and battery complete, supplying all lamps ($150 outfit); 50 Warner 60 mile speedometer; Disco self-starter; full nickel trimmings; one extra rim, and complete coupe interior furnishings such as dome light, electrical cigar lighter, toilet case, flower vase, etc.

FOR rainy fall days and the ensuing cold ones of winter, the "American Scout Coupe" is announced. It is of handsome Colonial design, electrically lighted and self-starting. Three passengers may ride with comfort. This new model at once leaps into favor among discriminating men and women — for all engagements, social or business.

If you wish a "Scout Coupe" we must have your reservation early.

American Motors Company, Dept. H., Indianapolis, Indiana

82% of MOON buyers know!

After a man has used his first car neither a salesman nor advertising can sell him the second—he lifts up the hood and looks for what he wants.

We carefully analyzed the 1912 MOON buyers in the city of New York.

Eighty-two per cent of them had owned cars before. Some were buying their third, fourth, or even their tenth car.

Such men know what they want and how to look for it.

A whirlwind of advertising no longer stampedes them. They look over the chassis and under the hood. They realize what standard construction means and demand it.

They look for a T-head motor, for heavy pitch transmission gears, and big, strong differentials.

Such men go into chassis construction as carefully as an engineer would. They pick the car to pieces, point by point.

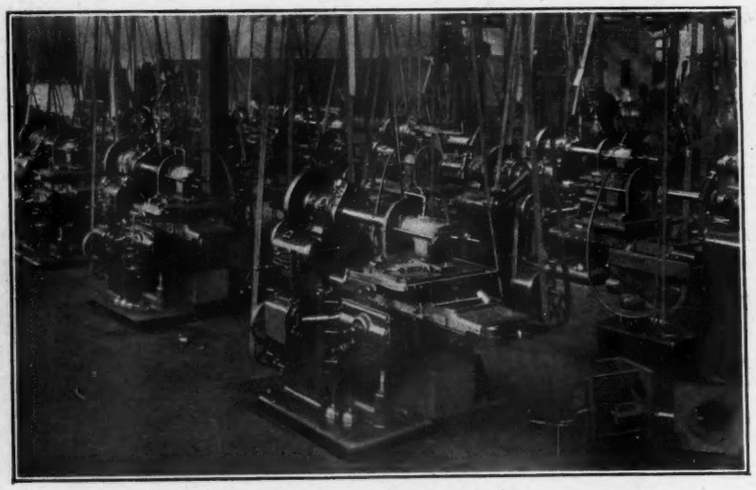
These are the kind of men who constituted the 82 per cent of 1912 MOON buyers in the city of New York.

The MOON "48" comes completely equipped with silk mohair top, special MOON-type wind-shield, the latest $50 Stewart speedometer, and the MOON electric self-cranking and lighting system.

It sells itself.

Moon Motor Car Company

4400 North Main St. **Saint Louis**



HEALD CYLINDER GRINDING MACHINES—VIEW AT FERRO PLANT.

WHAT "FERRO" SAYS—

We can hold cylinders to Standard Size a great deal better with a grinder than we can with a reamer.

The Ferro Machine and Foundry Co.
Cleveland, Ohio

This Firm uses Heald Cylinder Grinding Machines EXCLUSIVELY, AND HAS 18 OF THEM IN OPERATION.

They have made a very careful study of the manufacture of gas engine cylinders, both as to the matter of production and the efficiency in handling, so that every move counts in getting them out rapidly and to a high standard of accuracy.

Our booklet "Cylinder Grinding" tells all about it. If you haven't read it, send us your name and we will mail you a copy free

THE HEALD MACHINE COMPANY

26 NEW BOND STREET **WORCESTER, MASS.**

MOTOR AGE

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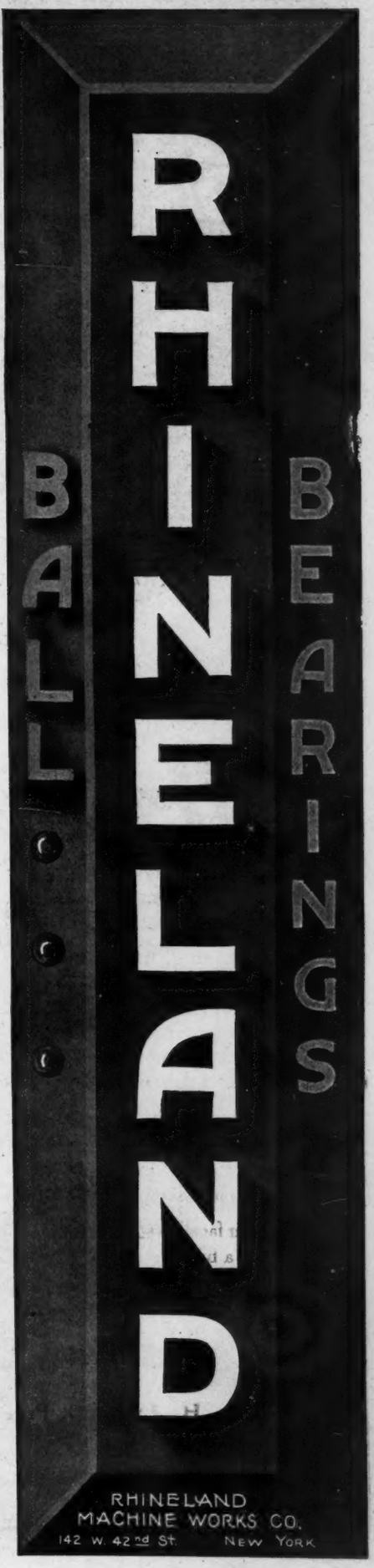


Overland 1913

$985

COMPLETELY EQUIPPED

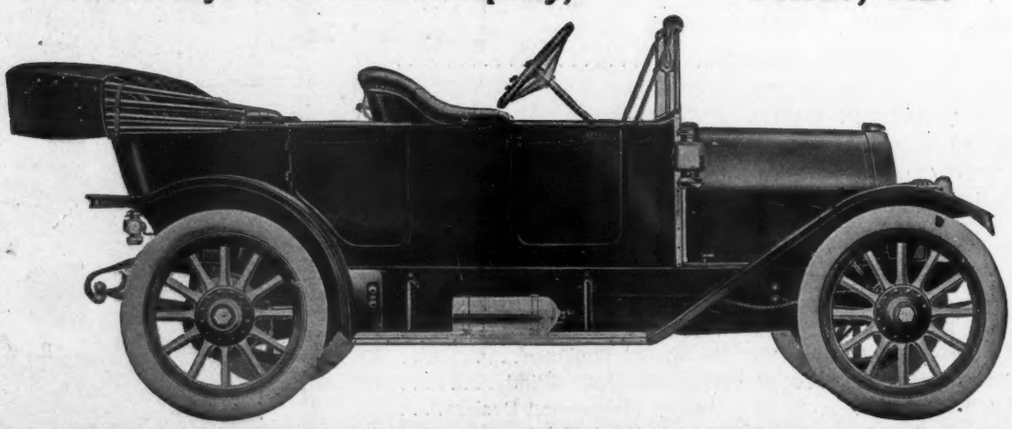
The Representative Car

Self Starter	Remy Magneto
30 Horsepower	Warner Speedometer
5-Passenger Touring Car	Mohair Top and Boot
110-inch Wheel Base	Clear Vision Wind Shield
Timken Bearings	
Center Control	Prest-O-Lite Tank

In the Overland Model 69T we offer the representative car; the product typical of the times. It has been and is the constant aim of each individual automobile manufacturer to give the very greatest value for the very least money. The Willys-Overland Company, in its 1913 product, has done just that. This car is the most this or any other concern can offer at anything like the price. A comparison with other cars costing $1200 drives this fact home. It is only our factory organization and equipment, systematized and complete to the last detail, and capable of an annual production of 40,000 cars, which makes this possible.

Our catalogue will tell you all about it; write today.
Please address Department 46

The Willys-Overland Company, Toledo, Ohio



VOL. XXII, No. 17 CHICAGO, OCTOBER 24, 1912 $3.00 PER YEAR

MOTOR AGE

When Winter Takes the Wheel

BY J. C. BURTON

The sound of crunching snow beneath the wheels;
A rabbit darting o'er a field of white;
A vagrant sunbeam through the gray sky steals;
A restful barrenness to left and right;
Above, the once-green boughs are cold and bare;
The arctic winds a moaning welcome sing;
There's crispy freshness in the clear, dry air;
Don't talk to me of touring in the spring.

The motor's throb is echoed in my heart;
There's petulance in every strident cough;
It seems to say, "Old pal, it's time to start,"
And I, too, am impatient to be off;
I grasp the wheel, the car jumps with a roar
As if it heard the call the same as I,
The snow banks up against the tonneau door;
Don't talk to me of touring in July.

Behind me I have left 1-minute miles;
Before me is a road house that invites
A momentary stop for liquid smiles,
A fresh cigar and kindred road delights.
A blazing fire sends forth a warming glow;
The tavern keeper asks another call;
Once more I'm off in swirling drifts of snow;
Don't talk to me of touring in the fall.

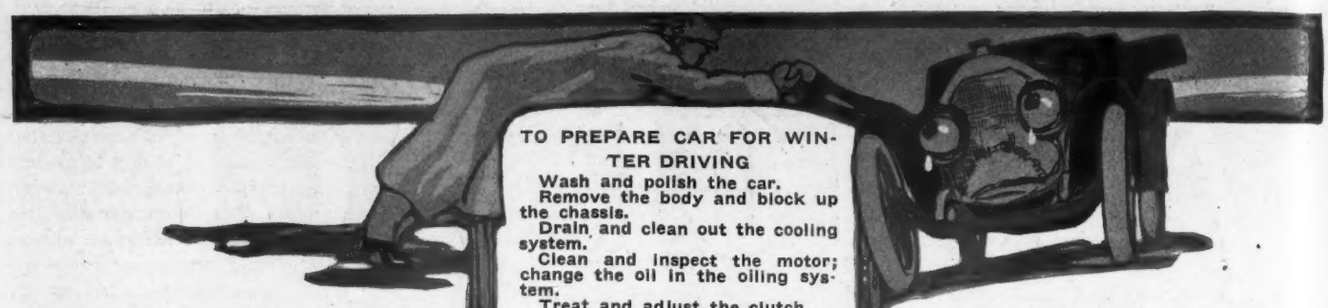
* * *

By Darwin S. Hatch

IT IS no longer the fashion to put the motor car away for the winter, for motorists have found that it can be made an all-the-year-round vehicle, if preparations are made to fit it for the changing seasons. For the transformation from fall to winter service, there are special arrangements necessary. There are others required if the fine-weather driver stores his car and takes to the street cars for his winter touring.

Along with the first flurries of snow which herald the coming of cold weather, there approaches the time when the ardent motorist must reach a decision as to whether he will brave the rigors of the wintry blasts behind his steering wheel or part for a few months with the four-wheeled companion of his country rambles. It used to be the fashion in our best motoring circles to run the car into winter storage in the fall and allow it to hibernate till the succeeding spring; but like sleighing in the olden days, motoring now has become one of winter's pleasures, and fewer and fewer are becoming the motorists who do not keep their mounts in commission the year round.

Motoring fashions have changed wonderfully in the past 10 years with the development of the things which make for the creature comforts of the motorist and his passengers. It is this which has made winter driving become regarded as a pleasure rather than the hardship it used



TO PREPARE CAR FOR WINTER DRIVING

Wash and polish the car.
Remove the body and block up the chassis.
Drain and clean out the cooling system.
Clean and inspect the motor; change the oil in the oiling system.
Treat and adjust the clutch.
Clean the gearset and thin the lubricant.
Clean and lubricate the universal joints.
Clean, adjust, and thin the lubricant on the rear axle.
Clean and adjust the brake.
Inspect and adjust the wheel bearings.
Clean, inspect and adjust the steering mechanism.
Inspect the tires, and have cuts or injuries repaired.
Clean out the gasoline tank and line.
Clean out the acetylene generator and line.
Inspect the ignition wiring.
See that wheels and axles are in proper alignment.
Apply or adjust the heating apparatus for the carbureter or motor car body.
Replace the body.
Fill the radiator with an anti-freezing solution.

to be considered. In place of the folding top and flimsy side curtains within which the motorists shivered as the wind sought out the crevices, we now have the convertible body or the extra inclosed top which can be put on at the approach of cold weather, converting the vehicle into a completely paneled closed car which defies the most searching attacks of Boreas.

There Are Interchangeable Bodies

Besides these poor man's limousines, as they have been called, there are the interchangeable bodies, giving a superstructure for either warm or cold weather. Then there are the new arrangements for heating the interior of the car. With the engine-starting devices with which most cars are fitted, the old labor of cranking when motors are cold and hard to start needs no longer be feared. Instead of having to crawl out of the seat and light dozens of matches in a strong wind and with fingers numbed by the cold, nowadays it is only necessary to press a button to light up.

Also, driving in the city in winter does not mean the negotiation of snow in the way it once did. City authorities recognize that the day of the horse vehicle as pleasure equipment is past and boulevards and drives are no longer kept covered with snow for the benefit of sleighing parties. They are swept as clean as at any day in summer following each snow storm.

Jack Frost has few terrors for those who take the trouble to get ready to welcome him. He may be hailed with delight by the enthusiast who will take advantage of spare time and money to make arrangements for his reception. When you can stick a closed top on your touring car or roadster and turn it into a limousine or coupe, run a pipe from your muffler or radiator and heat the inside, put on tire chains or non-skid tires to keep the wheels from slipping and pour alcohol in the cooling water to keep from cracking a cylinder in freezing weather, all the old drawbacks to cold-weather driving disappear.

Warm Steering Wheels

Even if you do not care to shut yourself up in an inclosed body, and for economical or other reasons prefer to enjoy the exhilarating effects of Boreas' cooling breaths, mitigated by windshield and side curtains, there is no reason why you should hesitate. If you are afraid of your fingers getting cold, you can buy quite reasonably a steering wheel which is electrically-heated from the storage battery. There are devices on the market which are miniature hot-water or hot-air heating plants in which the water from the cooling system in the one case and the hot gases from the exhaust pipe in the other, furnish the heat. Or, at less expense, there can be obtained a perforated footboard, which, when the rear end of the mudpan is closed, throws all the heat of the motor on the feet; so the fear of chilly toes need not deter you.

Or, if you prefer, you can purchase lap-robes which serve as gloves and overshoes at the same time, covering the feet and pedals and the hands and steering wheel. If the cold air comes up through the slots in the foot board which have been cut for the pedals to work in, it is a simple matter to tack on the under side of the footboard a sheet of rubber with a slit in it. It will be surprising what a difference in the atmosphere this simple fitting makes.

One of the bugbears of winter motoring has been the fear of skidding on the slippery and icy streets, but in these days of tire chains and non-skid tires, there is little danger to be apprehended from this source. However, it is not safe to attempt the negotiation of the streets in winter time without some means of preventing skidding. The motorist is too apt to find himself in the ditch or smashed against the curb with a broken wheel.

While on the subject of tires, it is well to say right here that it is not wise to do any driving in winter without a set of tires which are in the very pink of condition. Icy streets and frozen roads are particularly hard on tire equipment, and the never-pleasant operation of tire changing becomes really a hardship on a cold or stormy day.

Preparing the Car for Winter

Whenever any one attempts to give advice on the subject of winter driving, a great deal of stress is laid on a long list of repairing and overhauling that the car must undergo before it is to be considered ready for winter service, and then along toward the end of the instructions you usually find another list of about the same items that are necessary in the spring. The everyday motorist of ordinary means without a fairly complete repair shop in his garage rarely gets further than to read the instructions, when he becomes discouraged and decides that he might as well let his car rest over winter and do all the fixing at once in the spring.

Nevertheless, the work required to get the car ready for winter service is not nearly as formidable as it would seem at first sight. It is simply to see that the motor, body, and running gear is in good running condition. If the owner has taken decent care of his charge and treated it fairly, there is very little to be done, and nothing that should not be attended to periodically any way.

It is more important, however that the car be in good order throughout if it is to be used on the road in winter than it is if it is only employed in moderate weather. There are two reasons for this. The most important of these is that parts are slightly more liable to break in the cold and the shaking up that the car receives over rough, frozen roads, or the

strains of skidding on slippery streets makes the parts more likely to give way or loosen up. For instance, the motorist ought to be certain that his steering gear and brakes are in good order, for his safety is more likely to depend on them in winter. The other reason for a preliminary overhauling is that it is anything but pleasant to make adjustments or minor repairs on the road in winter time, and such of them as can be accomplished beforehand in a warm garage had better be attended to there, for the sake of comfort.

Scaring Off Jack Frost

There are two things that are of greatest importance in preparing the car for the road in cold weather and both of them are for the sake of the motor. The water in the radiator and cylinder jackets, and sometimes the pump, is in such thin sheets that very often it will freeze before larger bodies of water would be affected. When water freezes, it expands and something must give. Usually it is the radiator or a cylinder that is cracked. Either means that the car must be laid up for repairs, and a cracked cylinder often means an expensive replacement.

ANTI-FREEZING SOLUTIONS

Will not freeze at 15 degrees above zero:

Water	4 gal.
Alcohol	½ gal.
Glycerine	½ gal.

Will not freeze at 8 degrees above zero:

Glycerine	1 gal. 1 qt.
Water	3¾ gal.
Alcohol	5 pts.

Will not freeze 10 degrees below:

Water	3 gal. 1 pt.
Alcohol	1 gal. 1 qt.
Glycerine	2 qts. 1 pt.

Will not freeze 20 degrees below:

Water	1 gal. 1 qt.
Alcohol	2 gal. 2 qts.

Alcohol	Glycerine	Freezes
8 per ct. and	8 per ct. at	20 F.
12 per ct. and	12 per ct. at	10 F.
14 per ct. and	12 per ct. at	5 F.
19 per ct. and	12 per ct. at	— 3 F.
24 per ct. and	12 per ct. at	— 9 F.
34 per ct. and	16 per ct. at	—16 F.
62 per ct. and	35 per ct. at	—25 F.

Alcohol, either denatured or wood, alone or mixed with glycerine, is considered the best ingredient to add to the cooling water to keep it from freezing. About 40 per cent of alcohol added to the water will prevent its freezing at any temperature above zero. The trouble with alcohol alone is that it evaporates and you have to keep on adding more every few days. If you mix glycerine with the alcohol and add it to the water the mixture can be kept from freezing at 10 or 15 degrees below zero without being very expensive. You do not have to add glycerine again as it does not evaporate, and you do not have to add alcohol so frequently.

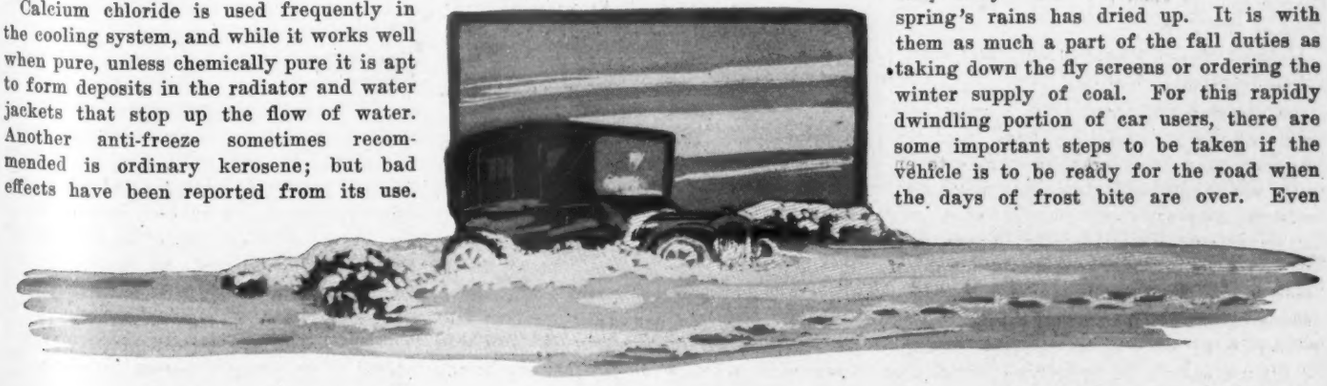
Using Calcium Chloride

Calcium chloride is used frequently in the cooling system, and while it works well when pure, unless chemically pure it is apt to form deposits in the radiator and water jackets that stop up the flow of water. Another anti-freeze sometimes recommended is ordinary kerosene; but bad effects have been reported from its use. One of them is that unless you schellac the inside of your rubber hose connections the kerosene will rot them. A more serious one is that on fairly warm winter days it lets the motor overheat, and hot kerosene not only has a disagreeable smell but is rather dangerous to have around.

If you use an acetylene generator instead of the more common tank, you will find it wise to mix about 40 per cent of alcohol with the water in the generator. Otherwise, you may have it freeze up and have to get a new one.

Another cold weather precaution that should not be neglected is to make sure that the motor will get plenty of oil. Lubricating oil gets thicker when it is cold and will not feed through the pipes as rapidly as when it is warm. If your motor is arranged so that the oil is all poured directly into the crankcase, or if the oil reservoir is right on the motor where it will keep warm, no special oil is required. But when the oil tank is away from the motor it is safer to use a thinner grade of oil in winter so that it will not congeal in the oil leads. You may find that the oil leads need cleaning out to get a free flow.

For the same reason that a lighter oil is used in the motor for cold weather driving it is a mighty good plan to clean out the old grease and oil in the clutch, gearset, rear axle and the wheels and put in a little thinner grade. This cleaning up will not hurt the car, even if you do not consider it necessary, and it is safe to assume that it does need this cleaning after a summer's roadwork. The motorist who has learned from experience, will take advantage of this or any other seasonable opportunity that presents itself, to lay up his car for a few days for the inspection and partial overhauling that is a wise precaution if the car is to be used through the winter months.



Inspection of Tires

To come back to the question of tires—it must not be forgotten that they will have the hardest service of any part of the car. If there are any cuts in the casings you will be wise to vulcanize them, or have them vulcanized, while the car is laid up for its winter grooming. At the same time, this is a good chance to see that the wheels run true, for if they do not, the treads are sure to wear rapidly, and some stormy day you will be hung up in the cold with a blow-out.

The steering connections ought to be tried to see if they are not too loose and if they are they had better be adjusted, for there is a great deal of strain comes on them in driving over frozen ruts or slippery pavements. There is no use risking your neck and that of your passengers for the want of a half-hour's work.

If there is time and inclination to give the car a complete overhauling before it is started on its cold-weather service, there is a number of other things that can be done with profit to the car and a probable saving to the owner in the long run. A list of these adjustments is given on page 6. The reasons for these adjustments are evident, but it is not advisable for the amateur to attempt them all without the advice or assistance of someone who has had some experience in overhauling a motor car. Otherwise, the amateur is quite likely to find that he has several pieces left over after he seemingly gets his car together again.

For Those Who Hibernate

There still is a small section of the motoring fraternity which, when autumn leaves begin to fall, reverently lay their cars away until the mud of the next spring's rains has dried up. It is with them as much a part of the fall duties as taking down the fly screens or ordering the winter supply of coal. For this rapidly dwindling portion of car users, there are some important steps to be taken if the vehicle is to be ready for the road when the days of frost bite are over. Even

when the car is to be left itself for some months, some little care on the part of the owner is necessary to put it into condition for this period of hibernation.

Among the first things to be done on putting the car away for the winter is to give it a thorough cleaning. Generally the last runs before the owner literally got cold feet, have been made over muddy roads, and the wheels, frame and body are covered with mud. If it is allowed to remain for several months, the body finish will be permanently spotted. Then clean out the lamps and acetylene generator. Take off all the brass or nickel fittings, lamps, horn and so on. It is a good stunt to store these with the cushions and mats in the house. Give all other bright parts a coat of vaseline to protect them from rust. Be sure to leave the top up and tighten the straps as much as possible, for if the top is left folded down it will be full of cracks in the spring.

Gasoline Evaporates

There is no economy in leaving the gasoline in the tank over winter, for the little that will not have evaporated before spring certainly never will vaporise in the carbureter. So drain out all the gasoline from the tank and carbureter, and the oil from the bottom of the engine and the oil tank. In order to keep the residue of oil from gumming up the walls of the tank and the oil leads, the best plan is to flush the whole oil system out with kerosene. Treat the cylinders in the same way and you will not find the pistons stuck so that the engine cannot be cranked in the spring. Have the storage battery fully charged, empty out the liquid, wash out with water and then fill it up with rain water.

Of course, the most important step is to drain out all the water from the cooling system. Open up all cocks in the water line and run the engine a few moments till it warms up to make sure the water is all out. Next to the water, the most important subject of precaution is that of the tires. In order to relieve them of the strain of supporting the weight of the car during its period of inactivity, the machine should be raised clear of the floor several inches and supported on jacks or tire savers. If these are not at hand in adequate supply, wooden trestles or even boxes can be made to do nicely. Then throw a tarpaulin over the car and forget it till spring.

Care of the Tires

If the motorist wants to be really careful of his tires he will take them off of the rims, clean them up, vulcanize any cuts that have appeared and then wrap them up. Lay them on a shelf where it is fairly dark in the garage and they will be ready to put on in the spring.

However, as we have remarked before, the motor car now is an all-the-year-around vehicle, what with anti-freezing compounds and starters, and in big cities especially there is no need of laying the car up when old Winter takes the wheel.

General Motors' Report

Net Profit of $4,838,488.55 for Year Ending July 31, 1912, Made by Holding Concern—Gross Business Done Shows Increase of $22,000,000—President Neal's Views

DETROIT, Mich., Oct. 17—The report to the stockholders of the General Motors Co. for the fiscal year ending July 31, 1912, was made public today. The income account shows a net profit of $4,838,448.55 after deducting $904,822.12 for depreciation of buildings and equipment, in addition to the ordinary expenses necessary to plant maintenance. The gross business done for the year shows an increase of $22,000,000 over that of the previous year.

The report also shows the outstanding capital stock of the company, not including stock held in its treasury and in the treasuries of its subsidiary companies, on July 31 as follows: Preferred stock, 7 per cent cumulative, $14,936,800; common stock, $16,371,183.05.

According to the report this represents an increase during the year of $543,300 preferred and $548,853.05 common stock. Of this increase $520,000 preferred and $520,000 common stock were delivered in part payment of the purchase of the outstanding capital stock of the Weston-Mott company.

The total profits from the operation of the profitable subsidiary companies amounted to $5,770,177.90, after deducting all expenses of the General Motors Co., from which has been deducted $1,023,421.40 for losses in the other subsidiary companies, leaving combined net profits to the General Motors Co., after deductions for depreciation of $4,846,756.50. These profitable subsidiaries as distinguished from those which did not operate to a profit, did 88.72 per cent of the total business of the entire General Motors organization, and according to the report successfully carried through on time their entire manufacturers' schedule, having sold their entire stocks of cars before the close of the fiscal year. It is predicted in the report that these same subsidiaries will produce probably close to 95 per cent of the entire output of the organization.

A net working capital of $20,666,865.16 is shown by the balance sheet, made up as follows:

Current assets:		
Cash		$ 3,080,920.98
Notes, $262,273.33, and accounts receivable		4,229,112.51
Inventories		17,578,366.15
Prepaid expenses		422,736.13
Total current assets		$25,311,135.77
Less current and accrued liabilities:		
Current accounts payable	$2,853,021.77	
Notes payable, Weston-Mott company	600,000.00	
Interest, taxes and pay-rolls accrued, not due	929,854.84	
		4,382,876.61
		$20,928,259.16
From which deduct amount reserved for 3 months' proportion of preferred dividend No. 8, payable November 1, 1912		261,394.00
Net working capital		$20,666,865.16

The capital expenditures amounted to $1,848,206.51 which was used for additions to real estate, plants and equipment. About half of the capital expenditure was used in the enlargement of the Cadillac Motor Car Co.'s plant and equipment, the output from which plant increased from 10,000 cars in 1911 to 12,000 for the past fiscal year.

In addition to the financial statements contained in the report, it treats of transportation difficulties with which the General Motors Co. has been confronted during the last year, as well as discussing results of the years' business and the outlook for future developments. President Neal's report follows:

Since your present board of directors assumed active control of your company's affairs on December 2, 1910, study of the conditions surrounding your several companies and prevailing in this industry has led them to the conclusion that the small motor car factory is badly handicapped and will become more and more so year by year.

Accordingly, your directors have been gradually concentrating the operations of the smaller companies with the larger and more profitable companies, or else, in some cases, eliminating the greater part of their machinery operations and so turning these smaller companies into plants merely for the assembly and distribution of the motor cars. This policy was inaugurated cautiously, and necessarily has proceeded slowly. The transfer of the manufacturing operations has in most cases involved the completion of the entire operations in hand at these smaller factories and also generally the design of new models before the necessarily standardized output of the larger factories could be utilized. This process has gathered momentum during the year just closed, and will be continued in the case of several of the companies during the coming year, the machinery of the smaller plants being gradually concentrated at the larger manufacturing plants.

The gross business of General Motors companies has suffered no diminution in consequence of these changes, the total for the 10 months ending July 31, 1911, amounting to $42,733,303.27, and for the year just closed $64,744,496.02.

These changes, for example, have thrown the manufacture of engines for these smaller companies into the large and highly specialized engine plant of your subsidiary company, the Northway Motor and Mfg. Co. This policy is adding to the profits of the Northway company, and at the same time these smaller companies are obtaining better engines than a small shop can hope to design, at less cost than they could be produced in the smaller factories.

It may be interesting to note in this connection that the Northway company, which produced only 4,846 engines for the 10 months ended July 31, 1912, is scheduled to produce the coming year, 20,000 engines. This increase is due partly to the policy spoken of, but also in large measure to the marked improvement in, and present high quality of the Northway engine, which caused the available surplus productive capacity of the Northway factory to be sought by other manufacturers far in excess of the Northway company's maximum capacity which, at present, with some moderate enlargements, just about completed, is 20,000 engines per annum.

The number of employes in your factories at the height of the manufacturing season of 1911 was 11,474; in the season of 1912, 16,584; and at the date of this report, 17,173. Your manufacturing operations for the current season are more advanced than during either of the 2 preceding years, and the cash re-

Benjamin Briscoe Resigns

Head of United States Motor Co. Will Step Out About November 1, After Which He Will Make Extended Vacation Trip to Europe—More About Reorganization

ceipts for the first 2 months of the new fiscal year were more than a million dollars ahead of the corresponding period last year. Your leading factories are still unable to supply the insistent demands for immediate delivery, and at this writing a further substantial increase for the coming year in your output and sales seems practically assured. It is believed that this will be accomplished by a gratifying increase in net profits.

An interesting feature of President Neal's report relates to the number of employes in the factories of the concern, it being shown that at the height of the 1912 season there were 16,584, while at the present time there are approximately 17,173 persons connected with the organization. The officers of the General Motors Co. are: Thomas Neal, Detroit, president; W. C. Durant, Detroit, vice-president; C. W. Nash, Flint, vice-president; Emory W. Clark, Detroit, vice-president; Standish Backus, Detroit, secretary; James T. Shaw, Detroit, treasurer; W. H. Alford, Detroit, comptroller.

The members of the finance committee are Emory W. Clark, W. C. Durant, Andrew H. Green, Jr., Edwin D. Metcalf; M. J. Murphy, Thomas Neal, James J. Storrow, Albert Strauss.

The directors consist of Joseph Boyer, A. N. Brady, Emory W. Clark, M. J. Murphy, Thomas Neal, James J. Storrow, W. C. Durant, Andrew H. Green, Jr., J. H. McClement, Edwin D. Metcalf, Albert Strauss, N. L. Tilney, James N. Wallace, Jacob Wertheim.

The following concerns in the motor industry are affiliated with the General Motors organization:

Buick Motor Co., Cadillac Motor Car Co., Olds Motor Works, Oakland Motor Car Co., Elmore Mfg. Co., Cartercar Co., Northway Motor and Mfg. Co., Peninsula Motor Co., Randolph Motor Car Co., Rapid Motor Vehicle Co., Reliance Motor Truck Co., Welch Co. of Detroit, Welch Motor Car Co., Champion Ignition Co., Jackson-Church-Wilcox Co., Michigan Auto-Parts Co., Michigan Motor Castings Co., Oak Park Power Co., McLaughlin Motor Car Co., Ltd., Weston-Mott Co., General Motors Export Co., General Motors Truck Co., General Motors (Europe), Ltd., General Motors Co. of Michigan.

LA CROIX THREATENS SUIT

New York, Oct. 14—Aggressive action on the part of the American representatives of the Mercedes pleasure cars has been indicated by the announcement made by Paul La Croix, of New York, licensee of the Daimler Mfg. Co., that infringement of the Mercedes patents and the license rights of the La Croix company will result in prosecution. The chief element of the difficulty is that a number of Americans have purchased Mercedes cars abroad and imported them without paying license to La Croix. The broader question of patent infringement is included in the problem that is presented by La Croix's action.

NEW YORK, Oct. 21—Benjamin Briscoe, president of the United States Motor Co., has announced his retirement from the leadership of the corporation, to take effect about November 15. The resignation was presented to the directors 3 weeks ago, or as soon as it was apparent that the reorganization plan would go through substantially on the basis agreed to by the creditors.

Mr. Briscoe has been a prominent figure in the motor car world for many years, but has been a leader since 1910. He was one of the founders of the Maxwell-Briscoe Motor Co., Briscoe Mfg. Co. and other large and profitable concerns. He was instrumental in the formation of the United States Motor Co. He was organizer and president of the A. M. C. M. A. and at present holds the post of vice-president of the N. A. A. M. He is secretary and director of the Automobile Board of Trade.

Mr. Briscoe has announced that he contemplates a trip to Europe with his family and during it he will arrange several matters of importance to the extension of the export business of the company.

The new stock issues of the reorganized company have been introduced into the curb market and have been traded in conditionally since last week. All the transactions are made with the proviso that the deliveries shall be made when the stocks are issued. The new common sold as high as 11½; first preferred up to 80 and second preferred at 40.

Under the proposed plan of reorganization, the stock will remain in a voting trust for not to exceed 5 years, except such shares as are required for the qualification of directors. The capitalization will be:

First preferred, 7 per cent cumulative	$11,000,000
Second preferred, 6 per cent non-cumulative	9,000,000
Common	11,000,000
Existing real estate mortgages	164,540
Total	$31,164,540
The total authorized capitalization will be	35,091,393

In a tabulation of estimated earnings for the first full fiscal year under the reorganization, the net is placed at $1,500,000. This sum would be sufficient to pay dividends on both preferred issues and leave $190,000 for the common.

Charles H. Sabin, Harry Bronner and James C. Brady have been named as the voting trustees in whom the active rights of the shares shall be vested for a term of years.

The underwriting syndicate by which it is proposed to finance the new company has agreed to purchase for $5,720,996 all the voting trust certificates representing the stock allotted to assenting stockholders. The Central Trust Co. of New York has been designated as depositary for securities and claims.

The return day for the court action, commenced by the Brown & Sharpe Mfg. Co., is October 28, when it is expected that the official status of the proposed organization will be determined.

KING COMPANY RESUMES

Detroit, Mich., Oct. 21—The King Motor Car Co., the entire assets of which were purchased outright by Artemus Ward of the firm of Ward & Dow, New York city, has been placed on a sound financial basis by its new owner. Already operations have been commenced in the plant for the turning out of the new models for the 1913 season, which consist of a roadster, touring car and coupe. The personnel of the new company has been completely changed and it is entirely in the hands of men who have had long experience in the motor industry. J. G. Bayerline, formerly connected with the Pope-Toledo, Pope-Hartford, Oldsmobile and Hudson, and up to a short time ago vice-president and general manager of the Warren Motor Car Co., has assumed the management.

It is the intention of the new King company to protect owners and all guarantees issued by the old concern will be assumed. It is also announced that a complete supply of repair parts will be carried in stock, and that deliveries on the new models are now being made. The cars will be sold under the trade name of King.

NEW KNOX OFFICERS ELECTED

Springfield, Mass., Oct. 18—Stockholders of the Knox Automobile Co. held a meeting here at which the committee appointed to investigate the business and determine whether it could be profitably continued, reported favorably.

New officers and directors were elected as follows: President, W. E. Wright; vice-president, H. G. Fisk; treasurer, A. E. Smith; clerk, Charles H. Beckwith. The directors elected are H. G. Fisk, E. O. Sutton, W. H. Chase of Leominster, M. J. Greenwood of Gardner, Elijah C. Johnson of Hartford, Conn., Peter Murray, W. H. Cutler of North Wilbraham, W. E. Wright, C. H. Beckwith. The executive committee of the board of directors will be composed of Peter Murray, W. E. Wright and E. O. Sutton.

PUTTING OUT NEW CARBURETER

New York, Oct. 21—The Schoen-Jackson Co., of Media, Pa., has finished the building of a complete plant in addition to the other factories of the company and will manufacture a new type of carbureter to be known under the trade name of Feps. According to the announcement of the company, the device is the invention of J. L. Fritz and among its special features claimed for it by the company is the fact that it has no springs, balls, cams or reeds.

Round the Lake a Rough Trail to Follow

Two Days of Running in Chicago Motor Club's Sixth Annual Reliability Sees Elimination from Perfect Score Division of Nine of the Fifteen Starters

OSHKOSH, WIS., Oct. 21—Fourteen cars finished the first day's run with perfect scores in the sixth annual reliability contest of the Chicago Motor Club today. Only one of the fifteen contestants which lined up at the start of the strenuous plug around Lake Michigan fell by the wayside.

When the cars had checked in here tonight after their first leg of 171 miles from Chicago, the only car missing was the National No. 8, entered by the Chicago Spring Wheel Motor Co., and equipped with spring wheels made by the entrant. This car had trouble with its rear axle in the morning and failed to check in at the noon control at Milwaukee. A wire was received here this evening by Starter Watts saying that the National was on the way and would be in Oshkosh before morning start.

Originally there were twenty-two entries, but seven were scratched—two Coey Flyers, the Chalmers six, Falcar, Detroiter, one of the three Stutzes and one of the Gray & Ritter entry. The Chalmers was in the Iowa reliability and could not get here in time, while most of the others were not ready when the starting time came. The Gray & Ritter car was a special which was to be used to try out a rotary valve motor, but the chassis was not ready in time to install the engine.

The field was reduced again tonight when Morton H. Luce, who had entered and was driving the Velie roadster, was compelled to abandon the tour because of a business deal which developed after he had started in the contest.

The threatened arrest of N. H. Van Sicklen, Sr., one of the judges, and who was distributing the confetti in the pilot car, was the only incident of the day. The Oshkosh chief of police considered it his duty to arrest the pilots for throwing confetti in the city streets, but was talked out of it.

Starting this morning under a cloudless sky, tourists found good roads all the way to Milwaukee. From there on the quality of the road varied. Most of it was fine gravel highway, and near Fond du Lac a stretch of about 4 miles of cement roadway was found which enabled the drivers to make up time lost on some of the poorer portions. A driving rain was the only uncomfortable feature of the afternoon, but this lasted only an hour—sufficient to make mud roads for the rest of the way to Oshkosh.

Tomorrow's run takes the tourists to Escanaba, in northern Michigan, a distance of 177 miles from Oshkosh. The noon control is to be at Oconto, 89 miles away. The road tomorrow includes some dirt which, with today's rains, will probably be mud. With the exception of a few miles, the road is expected to average fairly good through Neenah and Green Bay to Oconto, thence to Marinette. From there to Escanaba there is a stretch of fine macadam 63 miles in length, built under bounty from the state. Summaries first day:

TOURING CAR DIVISION

No.	Car	Driver	Penalties
1	Velie	John Brolley	0
2	Case	J. Hanson	0
3	Staver	E. T. Knudson	0
4	Staver	G. Monckmeier	0
5	Bergdoll	A. Monsen	0
6	Abbott	A. M. Robbins	0
7	R. C. H.	B. Parke	0
8	National	R. B. Gray	*

ROADSTER DIVISION

101	Velie	M. H. Luce	0
102	Stutz	R. E. Maypole	0
104	Burgdoll	T. Rooney	0
105	Moline	J. A. Wicke	0
106	Moline	F. G. Salisbury	0
109	Stutz	C. Anderson	0
110	R. C. H.	M. Barney	0

* Not reported—late

Many Penalized Second Day

Escanaba, Mich., Oct. 21—Special telegram—Six out of fifteen cars in the Chicago tour completed the second day's run to Escanaba tonight. Five have received penalties today, one had not checked in at 10:30, and three have withdrawn from the contest. Gray's National No. 8 withdrew at Racine; Velie No. 101 withdrew at Oshkosh this morning, and the R. C. H. went out this afternoon with a frozen motor.

Practically all the trouble to cars receiving penalties was due to rain, which continued almost without cessation from noon yesterday till this afternoon. Roads which would have been good in dry weather were made so sloppy that mud and water splashed in on magnetos and carbureters. There were two hills with mud so deep and so thick that several cars were stalled and had to be helped up. About 50 miles of state-built macadam between Marinette and Escanaba permitted the cars to make 50 miles an hour. Much time lost in negotiating bad stretches was made up on this road.

Velie No. 1 dropped 2 points for cleaning the carbureter which was stopped up with mud. Staver No. 3 got 8 points for the same trouble. Bergdoll No. 5 broke a steering knuckle near Green Bay, but Monsen, the driver, put in a new one and got into the night control less than 3 hours late, sustaining 161 points penalty. Bergdoll No. 104 was stuck for 30 minutes in a mudhole, but pulled itself out with a winch driven by the motor, receiving 30 points for lateness. Stutz No. 109 came into Escanaba several hours late on accounts of battery trouble and fenders bent by a broken tire chain, sustaining 182 points. Stutz No. 102 has not checked in and is over 6 hours late. Branstetter's Kisselkar, acting as pilot, had carbureter trouble at noon, and the Case threw the confetti for the rest of the day. The Staver pacemaker also had carbureter trouble from rain and mud, and Referee Root nominated the Velie as pacemaker for the day. The R. C. H. press car chugged through in good order, but had a narrow escape from upset when it skidded to the edge of a 12-foot ditch. Skillful driving kept it from going over the edge.

The Midland, carrying Starter Watts, was held up at Green Bay and both Watts and the driver, Kavanaugh, were arrested for scaring a horse and wrecking a buggy. They were not detained long.

The five cars finishing the day with perfect scores are: Case, Staver No. 4, Abbott, R. C. H. No. 7, and two Molines. Today's run of 177 miles, from Oshkosh to Escanaba, was covered at the regular running schedule of 20 and 18 miles per hour. It took hard driving to maintain the schedule through mud. The noon control was at Oconto. Tomorrow's run, from here to Newberry, is expected to be the hardest of the trip on account of the naturally poor road conditions and excessive rain. Although the distance is only 125 miles, the running schedule has been reduced to 13 and 11 miles per hour, with the noon control at Manistique. Summaries:

TOURING CARS

No.	Car	Driver	Penalties
1	Velie	J. Brolley	2
2	Case	J. Hanson	0
3	Staver	E. T. Knudsen	8
4	Staver	G. Monckmeier	0
5	Bergdoll	A Monsen	161
6	Abbott	A. M. Robbins	0
7	R. C. H.	B. Parke	0

ROADSTERS

102	Stutz	R. E. Maypole	Not in
104	Bergdoll	T. Rooney	30
105	Moline	J. A. Wicke	0
106	Moline	F. G. Salisbury	0
109	Stutz	C. Anderson	182

SOUTHER GOES TO EUROPE

New York, Oct. 22—Henry Souther, metallurgical expert and former president of the Society of Automobile Engineers, has sailed for Europe, in company with two officials of the Standard Roller Bearing Co., to inspect the plant of the Rudge-Whitworth Co. in England and to visit other manufacturing plants on the continent. It has been announced that Mr. Souther and his party will make a special study of the combination of the Sangster-Houk demountable rim with wire wheels of the type made by the Rudge-Whitworth company.

Ford, Driven by Owner, Wins Iowa Test

Results in Little Glidden of the Hawkeyes a Surprise Party to Dealers Because of Fine Driving of Dr. R. W. Soper —Only Penalty Caused by Water in Gasoline

DES MOINES, Ia., Oct. 21—A Ford roadster owned by Dr. R. W. Soper of Luther, Iowa, is the winner of the sweepstakes of the Iowa Automobile Association reliability run which closed Saturday night after a 5-day circuit over Iowa.

The little car went through with almost a perfect score, the only penalty being occasioned by water in the gasoline which caused the driver to stop the motor. In addition to winning the sweepstakes the Ford car takes the cup for the winning car in the $800 class.

The Paige roadster, driven by Bruce Malcom of the Paige factory, took first in the class for cars from $800 to $1,200. August Gronau of Des Moines, with a 1909 Chalmers, won first for the $1,200 to $1,600, and the Warren entry, which also acted as pacemaker, drew down the cup for cars in the $1,600 to $2,000 class.

No scores were announced by judges, only the names of the cars winning in their respective classes being given out.

Despite the fact that there was a small number of entries, the tour was by far the best ever held in the state. Far more interest was taken in the run outside of Des Moines than there was by the local dealers. Good roads associations fairly vied with each other in making for the pleasure and comfort of the contestants.

The penalties inflicted were for time on magnetos, time on tires, time on steering gear and time on gasoline tank.

Never before has any motor tour through Iowa met with such hospitality as was extended the little Glidden contestants. There were always from fifteen to twenty-five visiting cars with the run and at one time there were more than fifty from the towns along the route, acting as escorts for the contesting cars.

The first day out the towns along the White Pole road from De Soto to Council Bluffs declared holidays and spent their time in entertaining the tourists. All the towns were decorated and the roads had been dragged just an hour before the cars came along. Some of the White Pole enthusiasts escorted the competing cars all the way into Council Bluffs from De Soto. Council Bluffs was the first night control.

The second day's run from Council Bluffs to Sioux City, along the Missouri river, was the lightest of any during the tour, although the roads were not as good as others on the route. The third day took the tourists well into northern Iowa, the Hawkeye highway being followed part of the way from Sioux City to Fort Dodge, which was the third night control. Waterloo was the noon control on the fourth day and a most enthusiastic reception was given the tour here by the motorists of Waterloo and Waverly. Cedar Rapids was the night control.

The last day out furnished the longest drive of any day of the run, the distance between Cedar Rapids and Des Moines being close to 200 miles. Oskaloosa, the noon stop, was the last control and the cars sped through all the remaining cars on the route to get into Des Moines before dark Saturday night. The last car checked in at 5:10.

The fact that the contest had been postponed no fewer than three times prevented many Des Moines dealers from entering cars who had expected to do so. Many of the dealers were afraid of roads and weather so late in the season, but the contestants report the road conditions almost ideal and the weather during the entire week was well nigh perfect.

Dr. Soper, winner of the sweepstakes, is receiving unusual credit for his winning on account of the fact that his was the only privately owned car entered.

BOOSTING FOR ROADS IN OHIO

Toledo, O., Oct. 19—The Ohio Good Roads Federation, held a meeting at Columbus, Thursday afternoon, and inaugurated a campaign for legislation enabling the state still to realize the federation's project for an inter-county highway system. A resolution was adopted pledging the federation to work for the enactment of a law next winter authorizing a direct tax levy of $3,000,000 on the grand duplicate of the state for this purpose.

In order to stimulate the education of good roads experts the federation appointed a committee to urge Ohio State university and other educational institutions to include in their curricula courses in good roads construction and maintenance. The following were elected officers of the federation. Pesident, Jesse Taylor, of Jamestown; vice-presidents, John N. Willys and H. C. Vortriede, of Toledo; F. A. Seiberling, Akron, O.; A. P. Sandles, Ottawa, O.; David Dunham, Lebanon; secretary, H. K. Laird, Columbus; treasurer, B. S. Humphries, Cleveland; superintendent, W. A. Alsdorf, Johnstown; counsel, Smith W. Bennett, Columbus. Trustees, Will T. Blair, Thomas Henderson, B. S. Humphries, Fred C. Wood and Fred H. Caley, of Cleveland.

ELECTRIC MEN MAY TAKE PALACE

New York, Oct. 22—The New York Electrical Vehicle Dealers' Association has modified its plans with regard to the establishment of a motor mart for electrics. It was proposed to permanently rent the top floor of the Grand Central palace for the purpose, and to distribute the electric exhibits along the walls, leaving the track common to all and always ready for demonstrating work. The location of the palace, in close proximity of Fifth avenue and the boulevard, now nearing completion, between Forty-second and One hundred and twenty-fifth street, is said to be considered a great argument in favor of the project. A committee will shortly be named to elaborate on these plans.

Furthermore, the association hopes to straighten cooperative feeling between the dealers by their exhibiting in a common space, as knocking in such quarters would necessarily hurt the whole electric-car business. Corporate advertising is also among the aims of the association.

GOVERNMENT WANTS TRUCK BIDS

Washington, D. C., Oct. 19—More than ordinary interest attaches to a call for bids issued by the general supply committee of the government departments for furnishing various branches of the government service with both gasoline and electric vehicles. The bids will be opened in this city October 29.

Complete specifications are given in the blanks to be furnished manufacturers who have been asked to submit proposals. The specifications have been standardized by the bureau of standards, the purpose being to have trucks of a distinct type in the government service in the future. The specifications call for bids on trucks ranging from 1,000 pounds to 3,000 pounds capacity. The small trucks are intended for mail wagons, but the government does not yet know whether it will buy small or large machines.

The object of asking for bids on different types of cars, both electric and gasoline, is to obtain comparative information as to prices, etc. Manufacturers are told that for the present probably not more than half a dozen machines will be bought, but that this number will increase in the future.

Manufacturers desiring copies of the proposal blanks, together with full specifications, can obtain them by addressing the general supply committee, treasury department, Washington, D. C.

FILES BANKRUPTCY PAPERS

New York, Oct. 22—Schedules in bankruptcy filed in the United States district court by the Wishart Dayton Auto Truck Co. show liabilities of $33,899 and nominal assets of $13,569. The latter consist of one truck, a few accounts, and a claim of $10,000 for damages against the Dayton Auto Truck Co. The creditors are mostly banks.

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Motor Sense

THESE are days of motor sense! There is not any desire to remove horse sense from that mental rostrum it has occupied for so long; but motor sense goes further, hence should supersede.

MOTOR sense is very much needed with the man who drives his own car and specially needed with the chauffeur who drives his employer's car.

MOTOR sense is best defined as being the ability to know the right thing to do at the right time, and doing it. Motor sense takes into consideration the driving of the car in so far as piloting it over the highway is concerned, but goes further and takes cognizance of the workings of the motor, the clutch and the other mechanical parts, together with care that should be given each when the car is in use, or, at least, the consideration that they deserve.

MOTOR sense is needed in driving. A few negatives will explain: The driver on the narrow roadway who, holding the middle of the road, approaches a horse vehicle which he wishes to pass, until a short distance from the horses, then quickly swerves to the side, frightening the horses and terrifying some of the horse-vehicle passengers, is certainly lacking in motor sense. He is apparently ignorant of the right thing to do and is qualifying in doing the wrong thing at the wrong time.

PROPER shifting of gears in country driving calls for motor sense. Many car drivers forget, if they ever knew, that there is a range of maximum motor efficiency speed, be that range between 800 and 1,500 crankshaft revolutions per minute, or be it between 500 and 1,200. They overlook that it calls for judgment to insure that through the gamut of changing speeds from low to direct, due recognition must be given to this fact if the best speeds on the road are going to be had and the motor is not going to be unduly punished. When climbing grades they fail to get the motor speed on second gear into this range of efficiency before shifting into direct, the result being that the motor has to labor on direct and often the change has to be made back to second. The driver pays for his ignorance in dollars and cents. Motor sense would be much cheaper.

MOTOR sense is needed in manipulating the spark control when driving: Talk to forty different drivers and they all have a different theory; ride with them, and so often their theory fails in practice. Every motor is sensitive in this respect. One maker advises to maintain the same spark position on climbing grades, adding the caution to "keep the motor speed up"; another advises slower motor speed with a retarded spark; and another says "keep the spark up until pounding starts and then retard as necessary." The manipulation of the spark depends on the characteristics of the motor, which the driver must learn—the sooner the better. A small high-speed motor pulling a relatively heavy load must have its motor speed maintained on hills, and if the approach to the ascent will not permit of such, the driver should get back into second gear before beginning the ascent, thereby keeping the motor speed well up within its zone of efficiency. It is much easier on the motor to be operating at high speed within its zone than to be operating at low speed under its zone and laboring. It is the laboring that motor sense says to avoid. If the car will not make the climb on second, then change to low before the crankshaft speed gets out of the efficiency zone. Every road trip every day in the year has its examples of lack of motor sense in the matter of proper control of the motor speeds.

HE is a dwarf who is barely able to get his car to crawl over the crest of the hill on direct and who lauds himself with "that was a fine climb"; and he is a Hercules who can drop to second at the foot, be in high before reaching the crest and who scales the highest point with his motor roaring well up in its scale of maximum speed efficiency.

BUT the scope of motor sense is broader: It takes recognition of proper brake application, proper slowing down for traffic and reasonable care of tires as well as car parts. The grand-stand driver who rushes up to a theater entrance, applies the brakes, skids the wheels and generally strains the car is possessed of motor sense in inverse proportion to his spectacular characteristics. He lets his motor race idly while tearing up his tires and transmitting a needless strain through the transmission elements of his chassis. He is apparently void of motor sense. A rational use of the throttle would have been preferable.

MOTOR sense is needed in tires—very much so. There are thousands who have apparently exorcised it. They buy tires on a 3,500-mile adjustment period, and have them ruined at 2,000 miles. The tire expert gives but a second, and, with his omnipresent motor-tire sense, tells of under-inflation and over-loads. Instead of 75 pounds inflation pressure, there has been 40; instead of 90, there has been 55. Instead of four adults in the car, there have been seven; instead of smooth asphalt, there has been the stony country road; instead of the smooth hill, there has been the hillside filled with ruts. The driver has known only one thing—the capacity of the motor. It has been 15 miles with two people on the city pavement, and 35 miles with five people on the rutted hill or the stony highway. The 40-pounds inflation has been the same all through. Sometimes the owner pays, often the tire man. Motor sense is the remedy.

MOTOR sense is a full brother to "stitch in time." The new car owner should look over every chassis part periodically to see what troubles are exhibiting symptoms, and have a few remedies prescribed. This will discover loose chassis nuts, loose grease cups, loose spring clips, slack fan belts, vibrating lamp brackets, poor clutch adjustments, poorly adjusted brakes, loose door fasteners, and many other parts. He should consult his dealer to see if he is giving that attention that is necessary. In this way 5 minutes will do more today than $25 a month hense. Develop motor sense, and not only the erring one but the public as well will profit by the results that will be obtained by this development.

Ends Colorado Trail-Blazing Trip

Blue Book-White Denver-Salt Lake Expedition Completes Long Journey

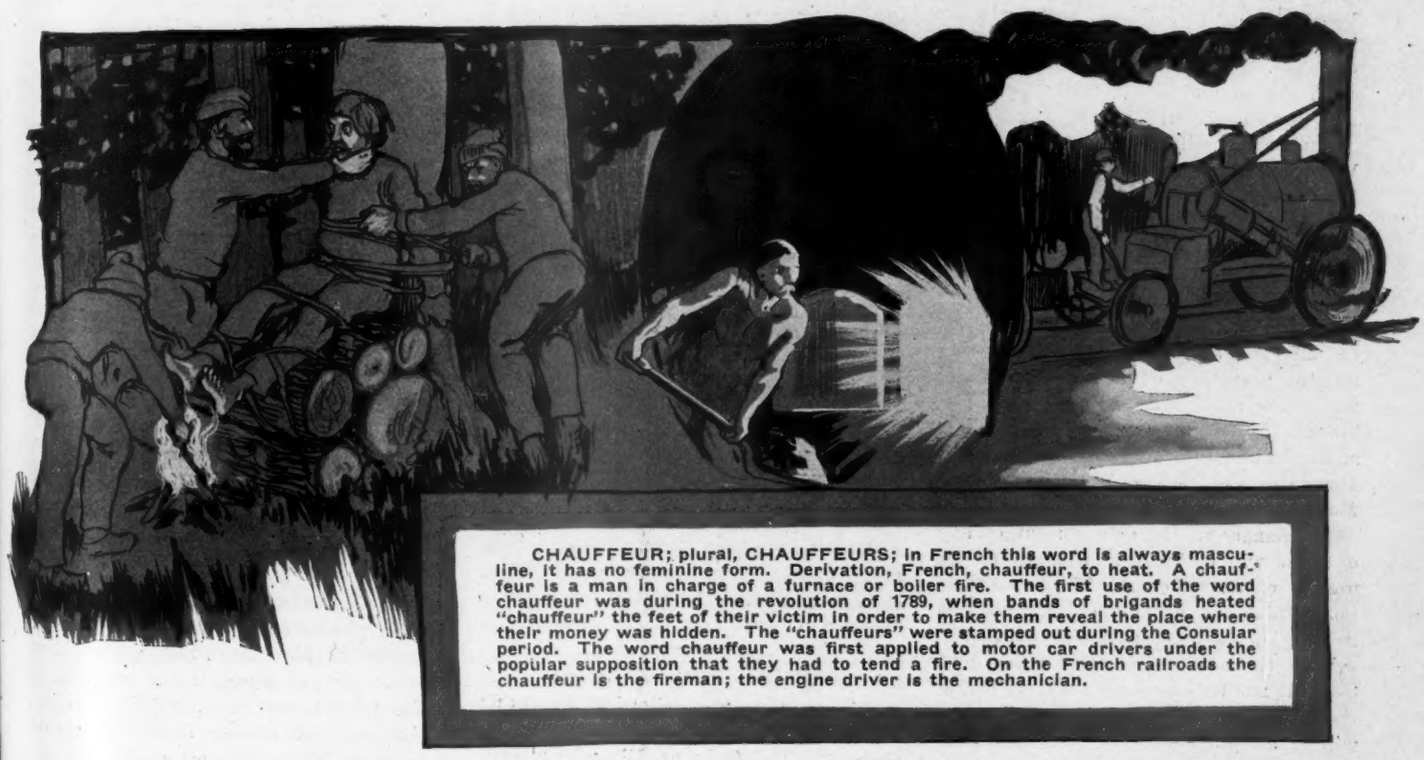
DENVER, COLO., Oct. 19—Trail-blazers who set out to secure data on the Denver-Salt Lake route in particular and Colorado roads in general returned to this city this evening after having covered 1,300 miles in a White six-cylinder furnished by the White company of Cleveland for this particular expedition, which was carried out under the direction of the Official Automobile Blue Book. In the party were John P. Dods, of the Blue Book; Nathan Lazarnick, the New York photographer; James A. Harris, advertising manager of the White company, and Walter Rheineck, also a White man. The trip was a wonderful one.

The party left here October 7 with the intention of laying out an official route to Salt Lake City, but after reaching Grand Junction, Colo., plans were changed and the return to Denver was made over the Rainbow route to Pueblo. The change in plans was brought about by the discovery that the Utah people have not completed their road work. They evidently have failed to realize the importance of improving the trail, so after a short trip into Utah out of Grand Junction, Dods and his party decided not to go to Salt Lake, delaying the routing of this stretch for another month, when it is the intention to send out another Blue Book car and secure all the necessary data to make the route complete.

On the outgoing journey the White six poked its nose along a trail that led through Buena Vista, Leadville, Wolcott, and Glenwood Springs to Grand Junction, a distance of 365 miles. Then, upon finding that Utah was not ready, the return trip was started, going through Gunnison, Salida, Canyon City to Pueblo, from which point the party went north to Denver, the distance on the return leg being 300 miles. In addition to the main expedition Dods covered several other stretches that connected with the main line, collecting road data.

"We took 450 photographs on the trip," said Pathfinder Dods upon the completion of the trip. "When we reached Grand Junction we went out into Utah a few miles to find that no work had been done in the desert and that heavy rains had made the roads bad. On consultation with the Grand Junction people we decided to defer the rest of the routing for a month."

Antecedents of Words Now Part of Motor Phraseology



CHAUFFEUR; plural, CHAUFFEURS; in French this word is always masculine, it has no feminine form. Derivation, French, chauffeur, to heat. A chauffeur is a man in charge of a furnace or boiler fire. The first use of the word chauffeur was during the revolution of 1789, when bands of brigands heated "chauffeur" the feet of their victim in order to make them reveal the place where their money was hidden. The "chauffeurs" were stamped out during the Consular period. The word chauffeur was first applied to motor car drivers under the popular supposition that they had to tend a fire. On the French railroads the chauffeur is the fireman; the engine driver is the mechanician.

Coming Motor Events

October 24-27—Track meet, San Antonio, Tex.
October 26—Track meet, York, Pa.
October 26—Los Angeles to Phoenix road race.
October 31—Track meet, Phoenix, Ariz.
November 2-3—Splash guard competition; Versailles.
November 6—Track meet; Shreveport Automobile Club, Shreveport, La.

*Sanctioned by A. A. A.

SHOWS.

November 8-16—Olympic show; overflow
November 16-23—Show at Atlanta, Ga.
November 22-30 Agricultural Hall.
December 7-22—Paris salon.
January 6-11, 1913—Cleveland show.
January 4-11—Montreal show.

January 11-18—New York pleasure car show; Automobile Board of Trade; Madison Square Garden and Grand Central Palace.
January 11-22—Brussels, Belgium, show, Centenary Palace.
January 20-25—New York truck show; Automobile Board of Trade; Grand Central Palace and Madison Square Garden.

January 20-25—Philadelphia show.
January 25-February 1—Montreal, Canada, show.
January 27-February 1—Detroit show.
February 1-March 1—Pleasure car and truck show, Cincinnati, O.
February 1-8—Chicago show.
February 10-15—Chicago Truck show.
February 10-15—Minneapolis show.
February 11-15—Ottawa, N. Y., show.
February 16-23—Richmond, Va., show.
February 17-22—Kansas City show.
February 24-March 1—Show, Cincinnati, O.
February 24-March 1—Show at Omaha, Neb.
March 3-8—Pittsburgh show.
March 8-15—Boston pleasure car show.
March 17-22—Buffalo show.
March 19-29—Boston truck show.
March 24-29—Indianapolis show.

Willys Increases Capital to $25,000,000

NEW YORK, Oct. 23—Special telegram—President John North Willys, of the Willys-Overland Co., Toledo, O., has increased the capital stock of this company from $15,000,000 to $25,000,000. The new capitalization is made up of $20,000,000 common and $5,000,000 preferred. This new capitalization represents an increase of $10,000,000 common. W. Salomon & Co., 25 Broad street, New York city, have purchased from Mr. Willys $5,000,000 common and $2,900,000 prefered, so that Mr. Willys will personally retain $15,000,000 common and $2,100,000 preferred.

This new capitalization means that Mr. Willys will take several millions out of the business and that the organization will be carried on on a larger scale than heretofore. At present the Willys-Overland factories are shipping 150 cars a day, and this output is on the increase.

With this increase in capital and the introduction of New York banking capital into the company, all of the stock of which up to the present has been owned personally by Mr. Willys, there will not be any changes in the management of the company. Mr. Willys will remain in personal charge, and his organization of capable lieutenants will not be changed.

Application will be made to have the Willys-Overland stock listed on the New York stock exchange.

During the last week rumors have been frequent that other companies were merging in a certain deal, but Mr. Willys positively denies any such rumors. At present the Willys-Overland Co., Toledo, O., has five subsidiary companies which are the properties of Mr. Willys. These properties are: The Kinsey Mfg. Co., Toledo, O.; Federal Motor Works, Indianapolis, Ind.; Garford Mfg. Co., Elyria, O.; Mora Mfg. Co., Elmira, N. Y., and Gramm Motor Truck Co., Lima, O.

No changes in the management of any of these will be made as a result of the present expansion of the Willys-Overland Co., which is a holding organization in relation to these subsidiary concerns.

With the new organization Salomon & Co. will not be represented on the executive committee, but the board of directors will in all probability be increased from five to seven, Salomon having two representatives and Willys five.

In addition to owning 75 per cent of the Willys-Overland stock, Mr. Willys has upwards of $2,000,000 investments in concerns identified with the motor industry, making his total holdings of $20,100,000.

The past year has been a very successful one for the Willys-Overland Co., the financial report June 30, 1912, for the 11 months showing profits of $3,300,000. At present the Willys-Overland Co. and the subsidiary companies have the following works forces: Willys-Overland, 5,300;

Banking Interests Purchase Big Block—No Changes to Be Made

Kinsey Mfg. Co., 1,200; Morrow, 1,000; Garford, 900; Gramm, 400; Federal, 300; total, 9,100.

The Kinsey Co. manufactures frames and radiators for the Overland cars and for the trade. The Morrow Co. builds gearsets, universal joints and screw machine parts. The Federal Motor builds motors for the trade and repair parts. The Garford Co. builds pleasure cars and trucks and the Gramm Co. trucks.

The several subsidiary companies are capitalized as follows: Garford, $2,000,000; Gramm, $1,500,000; Federal, $300,000; Morrow, $1,000,000; Kinsey, $3,000,000.

There will be a general conservative expansion in the Willys-Overland and all of the subsidiary companies.

The Willys-Overland will build 40,000 cars for 1913 and 60,000 for 1914. At the Gramm plant a new 1,500-pound truck is to be brought out and a new six-cylinder Garford will be brought out to sell at a medium price.

PEERLESS RAISES NEW CAPITAL

New York, Oct. 23—Special telegram—Additional capital, said to be $1,500,000, has been secured to enlarge the scope of the Peerless Motor Car Co., of Cleveland, O., according to indirect reports received in New York this week. President Kittredge is said to have interested J. Robert Crouse, a multi-millionaire of Cleveland, and the additional money was secured without going into the open market. The expansion of the truck end of the manufacturing business is given as the main cause for the new financing of the company.

Reports have been current that Mr. Kittredge was to retire from active direction of Peerless affairs, but official denials have followed the spreading of the reports.

RECEIVER FOR HALLADAY

Chicago, Oct. 23—Following the filing of a petition by creditors of the Streator Motor Car Co., Streator, Ill., who alleged the concern was insolvent, Federal Judge Landis late this afternoon appointed the Central Trust Co. receiver, under bonds of $5,0000, of the company that makes the Halladay car.

DAIMLER IMPORT CO. IN COURT

New York, Oct. 22—Bankruptcy proceedings have been instituted in the United States district court against the Daimler Import Co., which up to a short time ago represented the importation of Mercedes cars and trucks into the United States. The crisis resulted from alleged non-payment of rent to Harry Content & Co., owners of the premises at 751 Fifth avenue. The claim is for $1,826.

Judgments in favor of banking creditors have been rendered against the company within the past week amounting to $23,278. Nobody with any substantial interest in the company would predict its future course, and Paul La Croix stated that he understood that the concern had been practically abandoned.

FIRE ENGINE COMPANY REORGANIZES

Elmira, N. Y., Oct. 21—In order to provide the concern with $600,000 additional cash capital, the American-LaFrance Fire Engine Co., Elmira, N. Y., is considering complete reorganization. The plan proposed by the fiscal agents of the engine company provides that the present bondholders will receive 100 per cent in 7 per cent preferred stock of the new concern with a bonus of 33.3 per cent in new common stock. The preferred stockholders are to receive 50 per cent in the new preferred stock and 33.3 of common, while the present holders of common stock will receive 30 per cent in new common. With the $600,000 new preferred stock to be sold at par there will be a bonus of 100 per cent of new common.

ST. LOUIS HAS TIRE FACTORY

St. Louis, Mo., Oct. 19—Articles of incorporation were filed in Clayton, the county seat of St. Louis county, last week by the St. Louis Tire and Rubber Co., with a capital stock of $150,000 fully paid. The company is to use a building in University City, which was formerly used by one of the E. G. Lewis companies. Harry C. Barker, one of the directors of the new company stated that extensive improvements would be made in the building and that the company expects to be turning out motor car tires in about 6 weeks.

The concern will be managed by J. A. Swinehart, formerly of Ohio. The contracts with him and the patents are placed in the capital stock at $59,100 while the balance is subscribed in cash. Swinehart, the largest individual stockholder, has 900 shares of stock and the other six who have been named directors each have 100 shares. They are Harry C. Barker, C. M. Skinner, A. C. Einstein, W. H. Glasgow, Roy F. Britton and C. C. Collins.

Contracts will be let in a few days for the erection of an addition to the present building 30 by 100 feet in which will be placed the heavier machinery. All the machinery necessary for the operation of the plant has been received and the work of installation will start immediately, it is announced.

Traffic Worries Boston Commission

Sight-Seeing Motor Buses in Particular Cause Trouble in the Hub

BOSTON, Mass., Oct. 19—In its annual report just made public the Boston street commission has some interesting remarks to make relative to traffic regulations and sight-seeing buses. The commission would like to get rid of the job of looking after the motor buses because there are so many fights over locations each year, and there is a lot of political wire-pulling to get the best places. There also has crept in an abuse of which the commission only learned recently, but which it does not mention in its report, however, this being a species of graft where the person who owns the property or conducts a store just where the motor bus stands forces the owner of the sight-seeing vehicle to hand out something before signing a paper favorably, the street commission having insisted on this, believing it would cut down the number of requests for down-town streets.

Commission's Views on Traffic

Relative to the traffic regulations the commission states: "During the year, especially while the holiday traffic was at its worst, there was some complaint as to the working of the traffic regulations in the shopping district. Fault was found with the standing of vehicles in the side streets leading to Washington and Tremont streets. The complaints applied to delivery wagons as well as carriages and motor cars. Some people, if they could have their way, would not permit vehicles to stand longer than to allow their passengers to alight or get aboard, and it was suggested that the traffic regulations be amended to bring about this result. The board, while alive to the interests of the shopper who makes her way among the stores on foot, is conscious of the fact that there is a large number of people who come into the retail shopping district in vehicles of one kind or another. The desires of these people to reach the shopping district in this way cannot be ignored.

Carriage Trade Important

"The carriage trade, as it is called, is an important element in the retail business of the city. Many of this class of shoppers come from afar, from beyond the city limits. They are good customers and they should not be deprived of the privilege of standing their vehicles in some place convenient to them and to the stores they visit for a reasonable length of time. Unfortunately the retail district is so congested, the streets are so narrow, the open spaces are so lacking, that the matter cannot be regulated to give the best results. If the district possessed large squares or even a few fairly wide side streets a solution of the problem might be found in the setting aside of some of them for parking purposes. When the traffic regulations were being drafted 3 years ago the board had this difficulty in mind. It made a trial of a plan requiring vehicles entering the retail district to stop only long enough to permit their passengers to enter or leave them. The plan was not a success. Not only did the owners of the vehicles object but the shopkeepers joined them in protest, the latter claiming that the rule caused them a serious loss in their business.

Parking Space Limited

"Since the traffic regulations were put into effect the common side of Tremont and Park streets have been reserved for the vehicles of shoppers as a parking space. Vehicles are allowed to stand at these places for half an hour at a time. The board has often been asked to extend the time, some suggestions being for an hour, some for 2 hours, and it has been suggested that as long a time as 4 hours be allowed. The argument for the extension of the time is that women cannot do much shopping in half an hour. This the board does not presume to dispute. On the contrary, it agrees that the present time limit is too short.

"The space along the common on Tremont and Park streets is not equal to the requirements. It cannot accommodate many vehicles. If the time was extended to 2 hours, or even to 1 hour, it would make conditions worse than they are, as then the first vehicles to occupy the coveted space would most likely remain for the full time limit, thus keeping out others who should not be deprived of the privilege. The shorter time allowance means that more vehicles can be accommodated and consequently more people satisfied.

"Under the conditions as they now exist the board cannot see any way for the time limit for vehicles standing on Tremont and Park streets to be extended. As for prohibiting the standing of express and delivery wagons in the side streets of the shopping districts, it ought not to be seriously considered. Even the people who ask for such a rule would protest if they did not get prompt delivery of their purchases.

"The successful carrying out of the provisions of the traffic regulations depends largely on the police force of the city," the report says. "A strict enforcement of the rules as laid down would be a hardship and inconvenience to business interests. This the board realized when it made the rules.

Police Capable of Acting

"It had faith, however, in the police department and the men who control the congested business district, who would consider the spirit of the rules as well as the letter. The police have met the conditions well. It is remarkable how little complaint there is in the face of the extraordinary conditions the police encounter every day. Doubtless there are countless but technical violations, mostly unintentional, of the rules every day. It would be folly for the police to put men in court for such violations. Indiscriminate prosecutions would lead to the repeal of some of the rules which in geenral effect are good for the city.

"Because of the traffic regulations the duty of granting permits for the operation of sight-seeing cars has fallen to the board. During the past year it granted permits of this character for the first time. Previously such permits were issued by the police department. The board's authority in the control and operation of these vehicles is very limited, consisting only of naming the places where they may stand and fixing the time during which they stand, and to regulate their operation in streets where they would add to the congestion of traffic. There seems to be no definite law governing their operation, and in the opinion of the board some such law ought to be enacted.

The Sight-Seeing Buses

"Sight-seeing cars have a legitimate place in the life of the city. They appeal to tourists, who, by patronizing them, are enabled to see points of interest cheaply, quickly and comfortably. They appear also to be profitable to those who operate them and there is keen competition for the permits allowing them to be used. There being no law to govern their use, holders of permits operate pretty much as they please, charge such fares as they see fit to establish, and there is little or no responsibility behind them. Some of these sight-seeing cars are bought on the installment plan and are mortgaged to their makers or their agents. In case of injury to persons on the streets or to patrons of them there would be little chance of redress. In the opinion of the board a law ought to be enacted which would permit some municipal authority to regulate their operation, fix fares, exact a bond sufficiently large to guarantee indemnity to persons who might be injured in their operation and requiring them to pay a reasonable fee to the city for the license privilege."

AUSTIN JOINS MAIS FORCES

Indianapolis, Ind., Oct. 21—L. A. Austin who has been the sales manager of the Western Motor Co. and its successor, the Rutenber Motor Co., of Marion, Ind., for some years past, has resigned to become the sales manager of the Mais Motor Truck Co., of Indianapolis. Mr. Austin will enter on his new duties November 1.

Happenings in the World of Motor Speed

START OF ROBERTSON CUP RACE AT BRIGHTON BEACH

NEW YORK, Oct. 21—Racing at Brighton Beach Saturday as promoted by the Motor Dealers' Exhibit Co. was well received by the motoring public, although lowering clouds kept down the attendance. The promoters probably lost a little money because of the clouds, but the impression made on the public was distinctly favorable to future meetings.

The card was divided into eight events and two exhibitions and the running was done in precise accordance with the schedule and rules. The first event started sharply at 2:30 o'clock and the interminable delays of other days was absent.

The feature race of the day was the George H. Robertson trophy event at 25 miles, free-for-all, which was handily won by the National driven by Neil Whalen. At the start the Buick Bug made the pace, closely accompanied by Wishart's Mercer Special. The hot gait they pursued resulted in the retirement of both before the midway station had been passed. The National had been laid off the pace in the early stages and when the Bug went out with a blown tire and Wishart's mount faltered, Whalen came along with the blue car and tin-canned to the wire.

The National was chased determinedly in the last 5 miles by Ferguson's Mercer and the speedy Stutz came booming at the end, but the National had been aided in establishing a wide gap by reason of the sprint of Wishart's Mercer which had lost a lap earlier in the race. Wishart tried to pass the winner and in the duel that followed, the other cars were lost.

A full score of cars participated in the various events and a national tinge was imparted to the card by the appearance of such names as Mortimer Roberts, William Chandler, David Lewis, Ray Howard, Neil Whalen, Spencer Wishart, Ralph Mulford, Caleb S. Bragg and others.

During the afternoon Mulford gave the 1911 Vanderbilt cup winner an airing, circling the track in the Lozier in :53.30. Bragg made a few easy miles in the Fiat which won the grand prize race at Milwaukee this month.

The track was prepared for racing by spreading a heavy coat of asphaltic oil. The old bump, opposite the clubhouse turn was painfully in evidence and a new one developed up at the head of the stretch that prevented attempts at record-breaking speed. Summary:

Five miles, for cars under 230 cubic inches—Mason, M. Roberts, won; E. M. F., Chandler, second; Hupmobile, Meyer, third. Time, 5:18.55. Also ran, Hupmobile, Meyer; Herreshoff, Casey; Flanders, Wood.

Ten miles, for cars 231-300 cubic inches—Mercer, Ferguson, won; Bergdoll, Homan, second; Correja, Quinlan, third. Time, 9:33.15. Also ran, Mercer, Thebaud; Mason, Roberts; Mercer, Wishart.

Ten miles, for cars 301-450 cubic inches—Stutz, Lewis, won; G. J. G., Thebaud, second; Pope-Hummer, Howard, third. Time, 9:32.50. Also ran, National, Whalen.

Five miles, under 600 cubic inches—Mercer, Wishart, won; Mason, Mulford, second; National, Whalen, third. Time, 4:46.25. Also ran, Buick Bug, Howard.

Twenty-five miles, free-for-all—National, Whalen, won; Mercer, Ferguson, second; Stutz, Lewis, third. Time, 24:54.85. Also ran, Mercer, Wolf; Mercer, Wishart; Mason, M. Roberts; Buick Bug, Howard; Hupmobile, Meyer.

Five miles, invitation—Mercer, Ferguson, won; Mercer, Wishart, second; Mercer, Mitchell, third. Time, 4:56.85. Also ran, Mercer, Wolf.

Five-mile handicap—Stutz, Lewis, won; Bergdoll, Homan, second; National, Whalen, third. Time, 4:27.50. Also ran, E. M. F., Chandler; Mercer, Ferguson; G. J. G., Thebaud; Mercer, Wolf; Mason, M. Roberts; Correja, Quinlan; Hupmobile, Meyer; Flanders, Wood; Buick Bug, Howard.

Ten-mile handicap—Mercer, Wishart, won; Mercer, Ferguson, second; Stutz, Lewis, third. Time, 9:30.15. Also ran, Mercer, Mitchell; E. M. F., Chandler; Mason, Roberts; Mercer, Thebaud; National, Whalen.

Successful Brighton Beach Track Meet—Desert Road Race Preparations

PHOENIX, Ariz., Oct. 18—Phoenix is soon to be the objective point of two road races. The fifth Los Angeles-Phoenix race and the first San Diego-Phoenix race will start at 11 o'clock the night of October 26 and will finish at the Arizona fair grounds Monday, October 28. Twelve cars are entered in the race from Los Angeles and it is claimed that fifteen will engage in the contest from San Diego.

The San Diegans wish to prove that the route from their city to Yuma, on the Arizona side of the Colorado river, is better than the road from Los Angeles, by way of Brawley, Mecca, Banning and Colton, over which the Angel City cars will race. They refused to enter in the Los Angeles-Phoenix race and the route for that event was changed so it does not include San Diego. San Diego recently secured the sanction of the A. A. A. to have a Phoenix race of its own.

From the control at Yuma to Phoenix the two races will be over the same course. Every effort will be made by Attorney-General George Purdy Bullard, Arizona representative of the A. A. A., to avoid confusion at the control. As the Los Angeles race was sanctioned first, it is probable that the cars from that place will be given the right of way.

The details of the San Diego race have not all been arranged, but the purse will be $3,000, $2,000 of which is being donated by San Diegans and $1,000 by Phoenicians.

Within a few days the twelve cars entered in the Los Angeles-Phoenix race will draw for places. No. 1 will leave the Hollenbeck hotel at 11 p. m. Saturday, October 26. The others will follow at 5-minute intervals. The route lies along Spring street of Los Angeles to Eastlake park, east along Valley boulevard through Alhambra, El Monte, Puente, Lemon, Walnut, Spadra, Pomona, Ontario, Bloomington, Colton,

Beaumont, Banning, Palm Springs, Mecca, Brawley, Mammoth, Glamis, Ogilby, Yuma, Dome, Middle Wells, Palomas, Agua Caliente, Arlington and Buckeye, thence to the fair grounds at Phoenix.

All the drivers who have come over the route declare that on the California side it is in very bad condition. In places sand and mud make passage most difficult. A great deal of work that was done last summer has been washed away by late rains. This side of Yuma the road is all that could be desired. The course is exactly 511 miles in length and the general opinion is that it will be covered in 21 or 22 hours, though some optimists expect to see the winning car finish within 17 hours. To be placed a car must finish within 54 hours. The purse offered for the Los Angeles-Phoenix race totals $5,650, to be divided 65, 25 and 10 per cent.

Following are the cars entered and their drivers: Cadillac, Charles Soules; Buick, Louis Nikrent; Cadillac, William Bramlette; Cadillac, S. A. McKee; Franklin, Ralph Hamlin; American, Mark Burnell; American, W. F. Pipher; Schacht, G. M. Floersheim; Simplex, Al G. Faulkner; Mercedes, Charles Bigelow; National, Fred Fuller; Hupmobile, M. C. Nason.

It was in 1908 that the first Phoenix road race from Los Angeles to Phoenix was held. The first 3 years the course was not through Yuma but lay by Dos Palmas and crossed the Colorado at Ehrenberg. Last year it was changed to include San Diego and Yuma. The first race was won by a White steamer, the second by a Buick, third by a Kisselkar and fourth by a National. Harvey Herrick drove both the Kissel and the National, but will not take part this year.

ASHEVILLE AFTER A SPEEDWAY

Asheville, N. C., Oct. 19—Asheville is to have a modern motor speedway, ¾ mile in circumference, with either a concrete or a well-drained dirt surface, whichever proves the most feasible, within the shortest possible time it takes to build it. James M. Kelley, of New Orleans, a former ball player and sport promoter, and Otto B. Schoenfeldt, owner of the old race course in West Asheville, are the promoters, and they have deposited enough money in a local bank to cover the project. All arrangements were completed yesterday, and a force of men will be started at work fixing up the grounds and preparing for the enlargement of the present track at once.

RAIN STOPS SALEM MEET

Boston, Mass., Oct. 19—Rain put an end to the motor racing at Rockingham park, Salem, N. H., today after five of the ten events on the program had been run off, and so the meet was called off altogether because of the lateness of the season, and the fact that it had been postponed once already. Despite the fact that the weather was threatening all morning there were more than 5,000 people at the track when the races started and several hundred more came in before the program was ended. Summary:

Five miles, motor cars, non-stock, under 300 cubic inches displacement; amateur drivers—C. Oliver Iselin, Jr., Mercer, won; H. Cutting, Mercer, second; S. S. Bigelow, Buick, third; C. Smith, Hudson, fourth. Time, 5:50.

Ten miles, motor cars, non-stock, under 300 cubic inches displacement, professional drivers—Daniel Higgins, Studebaker 20, won; J. Pugh, Penn, second; Howard Warren, Hudson, third; A. D. Young, Mercedes, fourth. Time, 13:15.

RACING RESULTS AT NARBERTH

Philadelphia, Pa., Oct. 19—As an additional feature to the getaway day attractions of the inter-county fair, which has been in progress throughout the past week at the Belmont race track, Narberth, a series of motor races was conducted this afternoon with several well-known local drivers as contestants. In a 5-mile event between a Mercer car, F. Frietag driving, and Jimmie, Jr., Harvey Ringler pilot, the former won; time, 5:04¾. In another 5-mile event for amateurs Grover Bergdoll driving a Bergdoll car nosed out F. C. Biscol in a Regal in 5:49. John Menker in a Klinekar captured a 10-mile race after an interesting struggle with the runner-up, S. R. Blockson, in a Stutz, in 9:31.

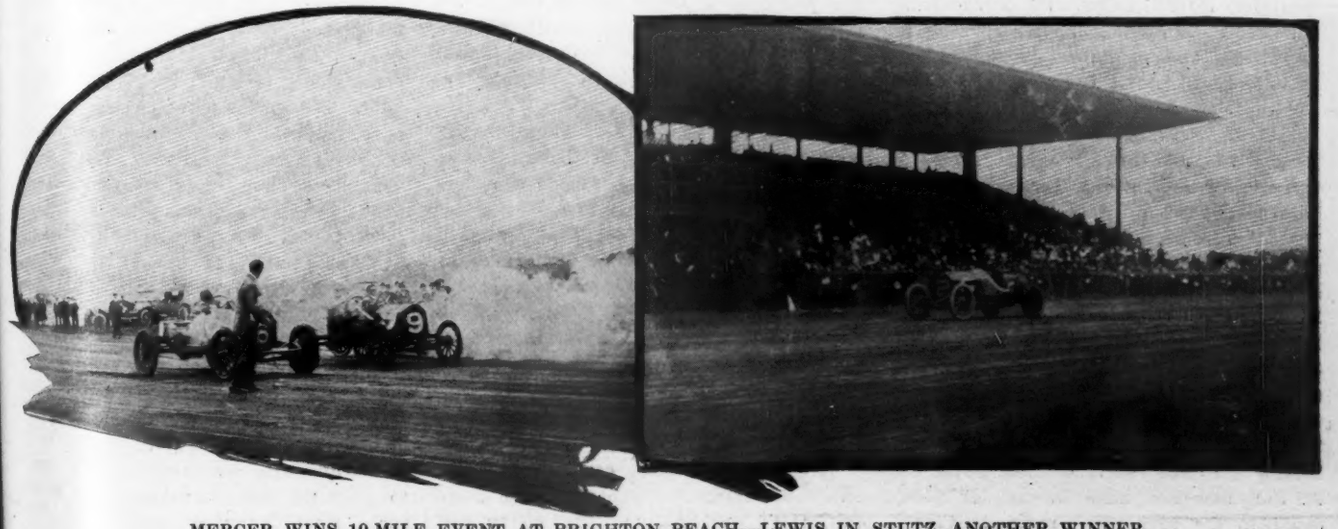
In a 50-mile free-for-all race the Stutz, S. R. Blockson driving, romped away with the honors from a field of six cars, the race being declared finished at the end of 48 miles, owing to the withdrawal of all the contestants but one, which was too far behind at the time to figure. Time for the 48 miles, 45 minutes.

DE PALMA MENDING RAPIDLY

Milwaukee, Wis., Oct. 22—Ralph de Palma, who was seriously hurt in a collision with Caleb Bragg's Fiat in the last lap of the grand prix, is driving a wheeled chair around Trinity hospital and the neighborhood these days. The smiling Italian, a hero in the eyes of Milwaukeeans, made his first public appearance on Saturday night, when he wheeled himself into the banquet hall of the Deutscher Club amid the cheers of 500 and participated in the joint stag of the Deutscher Club, Milwaukee Press Club and German Press Club of Milwaukee. His physicians say de Palma will be ready to leave the hospital for good in about 10 days. They will take no risk and intend to keep him in charge for a little longer time than deemed necessary. He is having a fine time and does not intend to leave Milwaukee immediately after his discharge from the hospital. The pilot is reticent when asked about the causes of his accident on October 5, but intimates that he may have a surprise for the racing world when he is well enough to think it all over.

TO DECIDE DUPONT CASE

Washington, D. C., Oct. 19—The supreme court of the United States is to decide whether T. Coleman Dupont may build a boulevard from one end of Delaware to the other. John H. Clendanial, a land owner, who objects to his land being condemned for that purpose, has filed an appeal from the decision of the supreme court of Delaware, holding constitutional the special act of the legislature accepting the Dupont offer. Along with the offer to build the boulevard was a condition that Dupont be permitted to construct public utilities, such as a street car line, alongside the vehicular road and it is against this feature of the act that Clendaniel chiefly objects.



MERCER WINS 10-MILE EVENT AT BRIGHTON BEACH—LEWIS IN STUTZ, ANOTHER WINNER

Sturmey Scouts the Cheap-Car Story

CHICAGO, Oct. 21—A letter just received by Motor Age from Henry Sturmey, one of the foremost lights in the British motor industry, scouts the story of a proposed $25,000,000 company to build cheap cars to stave off American competition. Mr. Sturmey says:

"I do not know where the New York correspondent of Motor Age gets his information, but he is considerably at sea when, in the issue of September 26, he writes and talks of the formation of a $25,000,000 capitalization here, to compete with the American cheap cars which are coming over in quantities. You can take it from me that there is not $25,000,000 in this country available for any sort of wild-cat scheme which financiers choose to put forward, but the real trouble with the British industry is that adequate capital is lacking for dealing with it as it should be dealt with and the failure of the big combination to make good does not help things any.

"The truth about this story of the $25,000,000 company, to meet American competition, is that one of our halfpenny papers—what you would term the yellow press over there—got its hair off over the success of the Ford and beat the big drum on the decline of British industry and the American sweeping the board. One or two of our impressionables here in the trade, who were out for a bit of self advertisement as much as anything else, played up to them, with the result that the paper gave a swagger invitation dinner to the trade to discuss things. None of the representative British houses took the trouble to go, but a few others attended the dinner and talked, and the talk was around a wholly impracticable proposal of William Letts—of whom you know a little—for a combination of British firms, to make a cheap car, and another suggestion was that a $2,500,000 and not $25,000,000 independent company might be formed for the purpose.

"The general result of the discussion was a beating of thin air. Both suggestions were turned down as unworkable, and, having digested the newspaper's good dinner, the crowd went home. I think you can leave it at that. Our manufacturers of class cars are not tumbling over themselves to get into the cheap trade any more than are the Peerless, Packard, Pierce-Arrow and other makers on your side who are making similar class machines."

Milwaukee Deficit Placed at $43,000

Management, However, Wants 1913 Road Races—Moross Asks Big Expense Account

MILWAUKEE, WIS., Oct. 22—The M. A. D. A. lost approximately $43,000 on the road races, and its officers regret deeply that the association's poor position should be taken advantage of by two of the participants, Bragg being one and Ernie Moross being the other. Moross late last week filed a claim for expenses for 14 days for himself, Burman, Horan, Decourcey and Toney, but payment was immediately refused because the Moross team was not in Milwaukee anywhere near 14 days, but was playing 1-day stands in Pittsburgh, St. Louis and other cities during the time it intends to charge for expenses at Milwaukee. Bragg objects to paying the rest of his entry fee, $875, claiming Bruce-Brown paid nothing. Therefore his $5,000 prize is held up by the dealers' association.

Moross also filed a protest against the award of fifth place in the grand prix to George Clark's Mercedes, because he claims Burman was running as well as Clark when the race was called off. It develops from this claim that no fifth place was awarded, Referee A. R. Pardington having placed only four cars which actually finished the race. The M. A. D. A. did, however, make a gift of $500, equal to the fifth place prize, to Clark, who was 40 miles ahead of Burman when the race was called to run no risk of life and limb due to the crowding of the course at the place of de Palma's mishap.

The expenses of the meet were approximately $118,000 and the total receipts only $75,000. While no financial statement will be issued to the public, for the reason that the affair is a private matter of the association, it is stated that the principal expense was the construction of the course, upon which $55,000 was expended. The prize list amounted to $20,500, which added to the road expense equals the total revenue.

A garnishee of about $375 placed on the bank account of the M. A. D. A. several days after the races has caused considerable inconvenience, but President Isaac G. Hickman says he is confident that this will be only temporary and the embargo will be lifted before the end of the week. The garnishee served to delay payment of a number of checks, among them that of Starter Fred J. Wagner, whom Manager Ruddle wired on Friday to be patient until early this week, when the matter will be cleared up.

"No one will lose a cent, though our deficit is enormous," said Manager Ruddle. "We are going to pay penny for penny and, what is more, we are going to have the international cup races in Milwaukee in 1913. The matter of financing the deficit is well under way and it will be a matter of only a week or so before we will be able to liquidate every debt contracted legally."

Manager Ruddle will go to New York late this or early next week to make preliminary arrangements for the running of the big cup races on the Wauwatosa course next summer.

President Hickman, Treasurer Jonas, who is chairman of the racing board, and Manager Ruddle believe the Motor Cups Holding Co. will award the races to Milwaukee for 1913 on the showing made this year. They say the matter of a deficit, which is being properly cared for, should have nothing to do with the award, if proper guarantees are again forthcoming—and this they will. There has been no criticism of the policing, a principal consideration. The course, upon which $55,000 was expended, needs only a small expenditure to make it good and proper for more racing. Ten thousand dollars will do wonders with the present Wauwatosa course.

Outside of the expenditure of $10,000 by the M. A. D. A. for improving the course for next year, it must be remembered that Milwaukee county will put $60,000 into one road forming the course early in the spring. This work will consist of paving the North Fond du Lac road from the city limits to the Town line road with concrete, having a roadbed of 25 feet. The work will be started April 1 at the latest and be ready by June 15 or July 1.

SPEEDWAY FOR DALLAS

Dallas, Tex., Oct. 19—If the plans of John S. Prince are carried out, Dallas will within the next 3 months have a speedway. Mr. Prince was before the Dallas Automobile Club this week and presented his plans for building the speedway, declaring that he would build one which could easily take a race of 120 miles per hour. The formal plans have not yet been agreed upon but it is probable that some definite action will be taken next week.

Prince's plans call for a board speedway 1½-mile in circumference, with the turns banked 40 degrees on the common half-circle. Coming out of the common half-circle, the cars will swing into Prince's famous triple radius, then the banking will slope away to 10 degrees into the stretch. The two stretches will measure 1,800 feet each and the diameter will be 1,500 feet. The grandstand will be 1,500 feet in length; there will be 200 boxes and two subways. Prince expects to have the speedway completed in time for a meet Christmas week.

Racing Outlook on Other Side of Atlantic

A committee composed of C. H. Verschoyle, Eli Sanger, William McLean, D. D. Ostott, Otto Lang and W. H. Bertrand has been named by the club to arrange with Mr. Prince the details of the speedway.

ALL-CANADIAN RUN COMPLETED

Victoria, B. C., Oct. 19—Thomas W. Wilby and F. V. Haney, the two transcontinental motorists who left Halifax, N. S., August 27 in a Reo, arrived here October 16. This completes the first cross-continent motor trip via an all-Canadian route ever made.

Wilby and Haney left Halifax, Nova Scotia, on August 27 for Victoria, B. C., in search of an all-Canadian highway from coast to coast. Their route lay via Truro, Nova Scotia; Moncton, N. B.; St. John, Fredericton, Reviere-de-Loup, Quebec, Three Rivers, Montreal, Ottawa, Belleville, Toronto, Sudbury, Sault Ste. Marie, Port Arthur, Bat Portage, Winnipeg, Brandon, Regina, Medicine Hat, Alberta, Calgary, from thence to Nelson and Victoria, B. C.

MILWAUKEE OFFICERS RE-ELECTED

Milwaukee, Wis., Oct. 21—Lee A. Dearholt, president; Frederick Gettelman, second vice-president, and Leonard E. Meyer, secretary, were re-elected to these positions at the annual meeting of the Milwaukee Automobile Club on October 18. Orrin E. Grovier, who has been chairman of the house committee for the past year, was elected first vice-president, and William H. Raymond, president of the Wisconsin State A. A., was elected treasurer. New directors elected were William E. Haefner and Russell R. Johnstone. Reports of the officers showed that 154 new members were elected during the past year, giving a present membership of 600, which is considered excellent in view of the fact that 131 members resigned because the dues were raised a year ago.

LAW NOT RETROACTIVE

Baltimore, Md., Oct. 20—Judge Duncan in the circuit court of Baltimore county has handed down an opinion that persons under 18 years of age who had obtained licenses to operate motor cars under acts of the legislature previous to 1912 cannot be prohibited from operating cars under the provisions of the act of 1912. The rest of the act is held valid. This opinion was rendered as a result of a test case made by the Automobile Club of Maryland. John T. Sadler, defendant in the case, secured his operator's license before the act of 1912 and was adjudged not guilty. He was arrested for running a motor car while under 18 years of age and was convicted and fined by a justice of the peace. It was this case in which an appeal was filed.

PARIS, Oct. 11—In addition to the usual short distance races, the organizers of the Ostend meeting will next year hold a long-distance race under the fuel consumption rules of the Automobile Club of France, these calling for practically 14 miles to the gallon. The meeting will occupy 4 days, on the first of which will be run the 500 miles Grand Prix d'Ostende, with prizes of $6,000, $3,000, and $1,000. On the second day there will be a 20-kilometers race on the Royal road; on the third day kilometer tests will be held; and on the fourth day the Liedekerke, Williams, Vanderlinden and Ostend cups will be competed for.

Entries are coming in slowly for the French grand prix race scheduled for the end of June or early July. In order that this race shall be held forty paid entries must be in the hands of the racing board not later than the last day of October. Up to the present only eight cars have been received, being three Peugeots, three Sunbeams and two Delages. It was generally believed that the minimum number of forty would be attained without much difficulty, but in view of the delay in sending entries fears are expressed that the race will have to be dropped. The time of closing has been most inconveniently selected, for during the period immediately preceding the opening of the London and Paris shows the manufacturers are not disposed to come to a decision regarding their racing program for the season of 1913.

Should the grand prix have to be taken off the cards, France will still have a big race in the 5-liter long-distance speed event to be organized by L'Auto. The first race of this nature was held at Boulogne in 1911, replacing the long-series of limited bore voiturette races; then the idea was taken up by the Automobile Club of France in its grand prix at Dieppe, and will again be repeated by L'Auto for 1913. Entries for this race close in the spring. It is known that the leading light-car manufacturers will take part, and Peugeot, among others, already has made arrangements to run in both the Automobile Club Grand Prix and L'Auto 3-liter event. The 3-liter race will be held for the last time in 1913, it being considered that 3 years' experience are quite sufficient to get all possible benefits out of one set of rules. The 1914 race will be under fuel consumption rules of the Automobile Club of France, known as the grand prix.

French Announce Big Reliability

Fifteen-Day 3,000-Mile Run Set for 1913—Price Limit on Contesting Cars Is $1600

PARIS, Oct. 12—With bonnets nailed down and all essential parts sealed, medium-powered French cars having a chasis prices of not more than $1,600 will take part in a 15-day 3,000-mile endurance test round France next March.

It is believed that the maintenance of all the seals intact for 15 consecutive days will not serve to prove the greater worth of the cars, while it will prevent the drivers giving those daily attentions necessary for any piece of mechanism, and which owners are quite willing to give at the beginning of a day's run. On this account the front and rear axles and the steering gear will be permanently sealed. The bonnet, the radiator filler cap, the under pan and the footboards giving access to the clutch and gearbox can have their seals broken for 10 minutes only every morning. At the expiration of this time the seals will be replaced and cannot be broken without the loss of points.

The arrangement will allow drivers to screw down grease cups, verify their motors, fill the tanks and make slight adjustments, but the time will not be long enough to make any repairs. The breakage of the radiator filler cap will entail a loss of 2 points; if the underpan or the footboard seals are removed, 3 points will be deducted for each; the lifting of the bonnet will cause a loss of 4 points. If the permanent seals are lost the car will be eliminated, and failure to maintain an average of 18½ miles an hour on any of the stages will also entail disqualification.

The competitors will start from Paris on March 1 and make a loop round France, the daily runs averaging about 160 miles. Although 18½ miles an hour is the minimum speed, it is no indication of the speed that will be maintained, for all such work on the car as filling tanks, changing tires, as well as stoppages for meals, will have to be carried out during the running time. The circuit will comprise every class of road, with a considerable amount of mountain climbing in the Pyrenees and the Alps.

With a $1,600 limit, the whole of the popular medium-powered cars will be admitted. The limit has been fixed on the chassis instead of the complete car because of the wide difference in body value on this type of European chassis. In all cases the competing cars must be completely equipped touring models having not fewer than two seats, with hood, windscreen, horn, running boards, lamps, headlights, etc. Numerous entries have already been received for the tour.

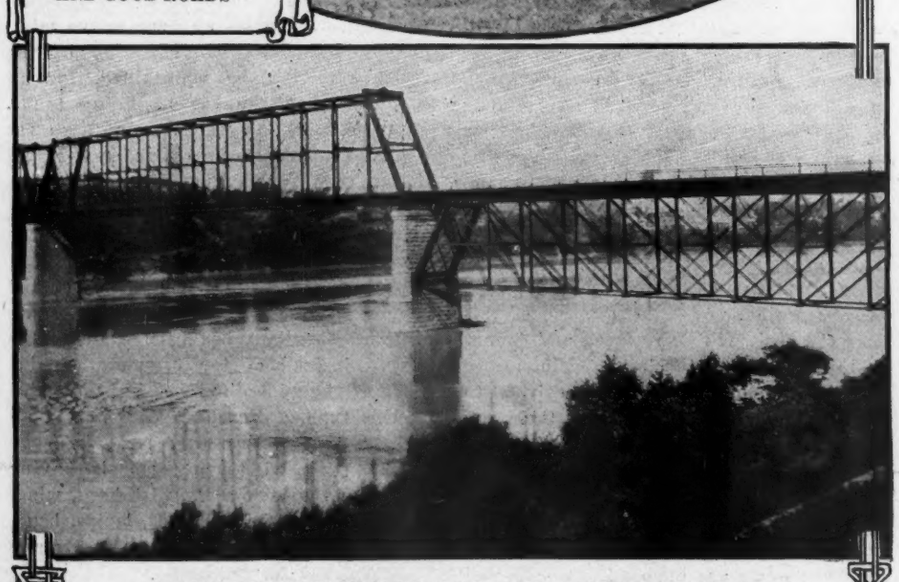
Routes and Expenses of 38-Day Camping Tour

By Henry Field

SHENANDOAH, IA.—Editor Motor Age—I have just returned from an extended motor car trip through the south and southwest, and have had a good chance to observe some of the roads which have been highly boomed. We found some very good roads and lots of poor roads, which, of course, were partly due to unfavorable weather conditions. Everything considered, the best road we traveled was the Denver-Omaha transcontinental road through Nebraska and Colorado, and it was the best marked road with the exception of the Waubonsie trail, over which we traveled through a portion of Iowa. The Waubonsie trail has them all beaten on thorough marking with telephone pole marks and big road signs for the guidance of tourists.

STREAMS IN ESTES PARK ATTRACTION FOR CHILDREN

NEBRASKA - COLORADO STATE LINE AND GOOD ROADS



BRIDGE OVER MISSOURI RIVER AND WAUBONSIE TRAIL

I found insufficient marking to be a common weakness with most of the roads. After a visit in Estes Park, Colo., we went south in Colorado over the great north and south highway. This is a good road; well kept up and fairly well marked, but it had been badly cut to pieces with cloudbursts. However, the county commissioners of the various counties through which it passed were doing everything in their power to put the road in shape again, and I remember in one place where a bridge was washed out, a man and team where stationed to pull the cars through the sand of the river bed and made no charge whatever.

Coming east we traveled the Santa Fe trail from Pueblo to Dodge City, Kan. We found it to be a beautiful road in Colorado, but in very bad shape from the Colorado-Kansas state line on east to Dodge City. It was poorly worked, not dragged at all, and in very bad shape, although there was an immense amount of motor car travel over it. At Dodge City we left the Santa Fe trail and swung south into Oklahoma and we found the Oklahoma roads to be the worst of the trip. It is a fact that we found only 5 miles of dragged roads in our entire travel in Oklahoma. There was oceans of bad sand and when we got into the red clay hill country, the roads were literally cut to pieces. As this red clay gullies out

Touring Information

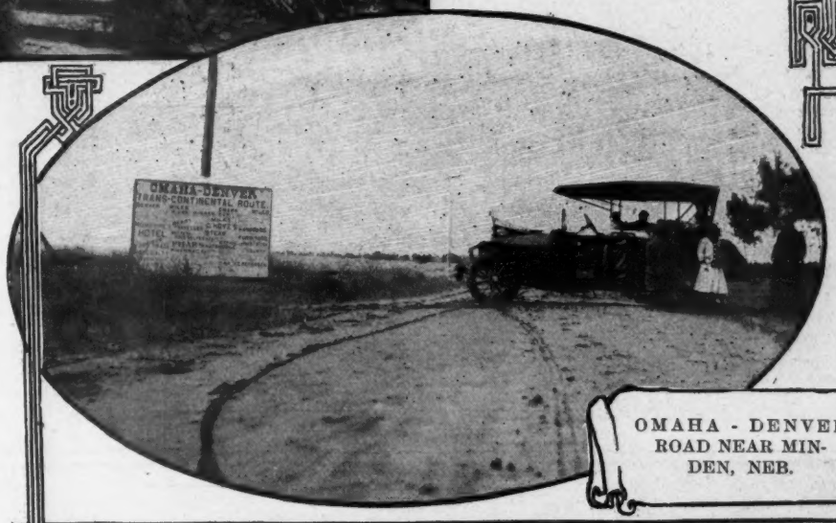
for Family of Eight Average $5 a Day

HOMESTEADER'S SHACK IN NEBRASKA

easily, seemingly no attention is paid to dragging the roads by the resident sof the county.

When we turned north again, our intention was to follow the Meridian road, but diligent inquiry failed to discover anyone in Oklahoma City who knew anything about this road. We finally succeeded in getting directions to Guthrie, which we estimated must be on the Meridian road and from there we went on north through Perry, Tonkawa and Blackwell to the Kansas state line, but found the roads practically all unworked and with no road markings whatever. No one seemed to know anything about the Meridian road, although we inquired diligently. When we struck the Kansas state line at South Haven we found good roads and hit what was evidently the southern terminus of Meridian road. From these clear across the state of Kansas we followed as nearly as possible the Meridian road and found practically all of it well worked and possibly half of it dragged by the farmers.

The markings, however, were very poorly done. We saw some of the blue and white metal signs averaging possibly two or three to a county, but they were not placed at every intersection and turn as we do it in Iowa, but only at the turns and sometimes this meant 10 to 15 miles apart, and except in two or three northern counties we found no telephone pole marks whatever. There ought, by all means, to be telephone pole marks at every turn, cross road, and all intersections. When we finally did strike telephone pole marks, they were not uniform in the different counties. One had a blue and white, another county a red, white and blue and still another had yellow marks. They seemed to be uniform across the county, but would change in the next county. One county I remember had a red arrow on white pasteboard tacked on the telephone poles at the turns. This changing of signs so often was very confusing. In Nebraska we found the Meridian road better marked, but even there it was only at turns and not at every crossing as should be the case. Where

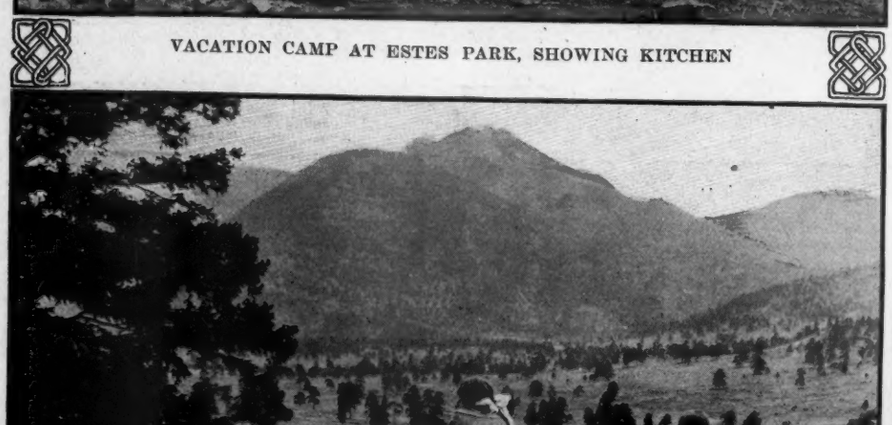


OMAHA - DENVER ROAD NEAR MINDEN, NEB.

ROADSIDE CAMP IN NEBRASKA, EN ROUTE FOR COLORADO

LONG'S PEAK AT AN ALTITUDE OF 9000 FEET

VACATION CAMP AT ESTES PARK, SHOWING KITCHEN



VIEW TAKEN FROM DEER MOUNTAIN IN ESTES PARK

we crossed the Santa Fe trail in eastern Kansas the roads seemed to be in splendid condition, but were evidently short on markers here, too.

Above all things, something ought to be done to wake up our Oklahoma friends on the question of good roads. With a good six-cylinder car and with no mud to hinder we still had to fight hard to get an average speed of 12 miles an hour from Pond Creek to Oklahoma City going south through Enid, and from Oklahoma City to Tonkawa through Guthrie and Perry coming north, while through Kansas on the Meridian road where it was dragged we easily made an average of 25 miles an hour.

My expenses might be of interest to motorists who enjoy spending their vacations as I did. Although I did not keep an exact record, it was very close to $5

Road Directions for

WISCONSIN SHORT RUN

MENOMONIE, WIS.—Editor Motor Age—I would like to know of the most direct route to St. Paul, Minn., and the distance. Where would be the best stop in case of accident?—H. T. Pittman.

This is only a distance of 63 miles and the country is a little rolling in places, the roads being very good natural dirt most of the way. The towns are North Menomonie, Knapp, Wilson, Baldwin, Hammond, Hudson, Lakeland, Minn., and St. Paul. At Hudson a ferry is necessary over the St. Croix river and the charge is about 50 cents.

If your car is in good condition before you start, it is not likely that you will have any trouble outside of tire changes, in so short a distance.

HEADED FOR LOS ANGELES

Hitchcock, S. D.—Editor Motor Age—I am figuring on taking a trip to Los Angeles and would like a route from Huron. I want to leave about the last of October, so I expect I will have to take the southern route.—M. C. Dawson.

Going east from Huron to Cavour, Iroquois, Manchester, De Smet, Lake Preston and Hetland you reach Arlington, which is on the Meridan highway and can be followed directly south as far as the Santa Fe trail through the towns of Madison, Salem, Bridgewater, Freeman, Yankton, either using ferry or pontoon bridge over the Missouri to Aten, and continuing in Nebraska through Wausa, Pierce, Norfolk, Madison, Humphrey, Columbus, Shelby, Stromsburg, Fairmount, Geneva, Strand, Brunning, Belvidere, Hebron, Chester, Belleville, Concordia, Minneapolis, Salina, Bridgeport, Lindsborg, McPherson, Moundridge, Heston, Truesdale, Newton. So far your mileage is 593.

Following the Santa Fe trail with its excellent hotel accommodations the routing is Newton to Halstead and Hutchinson 37.6 miles. Great Bend is 64.5 miles further west and is reached by routing through Nickerson, Sterling, Lyons, Chase and Ellinwood. A distance of 84.1 miles to Dodge City is through Dundee, Pawnee Rock, Larned, Garfield, Kingsley, Taft, Offerle, Spearville and Wright. Traveling through Sears, Howells, Cimmeron, Ingalls, Charleston, Pierceville, to Garden City is 54.6 miles and through Lakin, Hartland, Kendall, Mayline, Syracuse, Medway Coolidge, Holly, Grenada, Keon, Grotte, Morse, Lamar, Hasty, Las Animas to La Junta, Colo., is 166 miles.

La Junta to Raton, N. M., is 117 miles through Timpas, Thatcher, Simpson, Poso, Kadrew, Hoehne, Elmora, Trinidad, Starkville, Gallinas, Morley and Raton. The roads are fair dirt and you will find good mountain roads in the Raton pass. Raton to Las Vegas —116 miles— is Dorsey, Maxwell, French, Springer, Rayado, Colmor, Nolan, Wagon Mound, Watrous; Las Vegas to Santa Fe—76 miles—is Tecolote, Bernal, San Jose, Pajarita, Rowe, Pecos, Glorieta, Canocito, Santa Fe. To McCarty's it is 149 miles by way of La Pajada, Domingo, Algodones, Bernalillo, Sandia, Alameda, Albuquerque, Atrisco, Laguna and Cubero; continue 134 miles to Nation's ranch, Laguna Salina and Springerville. To Globe is through Cooley's ranch, Rice and Cutter being 148 miles, and then to Phoenix 115

a day for the entire time. This included the expense of the car and the living expenses of our family of eight— myself, wife and six children. Of the 38 days away from our home, we camped 15 days in one place, which left 23 days that we were on the road. The total distance traveled was 2,630 miles, but about 300 miles of this was during the 15 days we camped near Estes Park, Colo. Some days we made as high as 230 miles, but other times we would camp as long as 2 or 3 days, and that cut our average down to 100 miles a day.

The daily expenses for the car varied from $2.10 to $2.75, this including only gasoline and oil. We had a few repairs, but they are not included in this estimate. As we were camping out, the living expenses for our family were quite low, and I am sure they did not exceed $2.50 a day.

Touring Readers

miles over a fine stretch of road through Roosevelt, Goldfield, Mesa, Frankenburg and Tempe.

It is a distance of 207 miles to Yuma through Coldwater, Liberty, Palo Verde, Arlington, Aqua Caliente, Castle Dome and Gila City.

Crossing the Colorado river into California you continue to Ogilby, Drylyn, Glamis, Mammoth, Brawley, Imperial, El Centro, Devil's Canyon, El Campo, Potrero, Dulzura, Jamuel, San Diego, La Jolla, Del Mar, Encinitas, La Costa, Oceanside, Las Flores, San Luis Capistrano, Irvine, Tustin, Santa Ana, Anaheim, Fullerton, Habra, Bethel, Whittier, Montebello and Los Angeles. Yuma to Los Angeles is 362 miles.

This complete routing is outlined with maps and running directions in the No. 5 Blue Book, should you care to supply yourself with one.

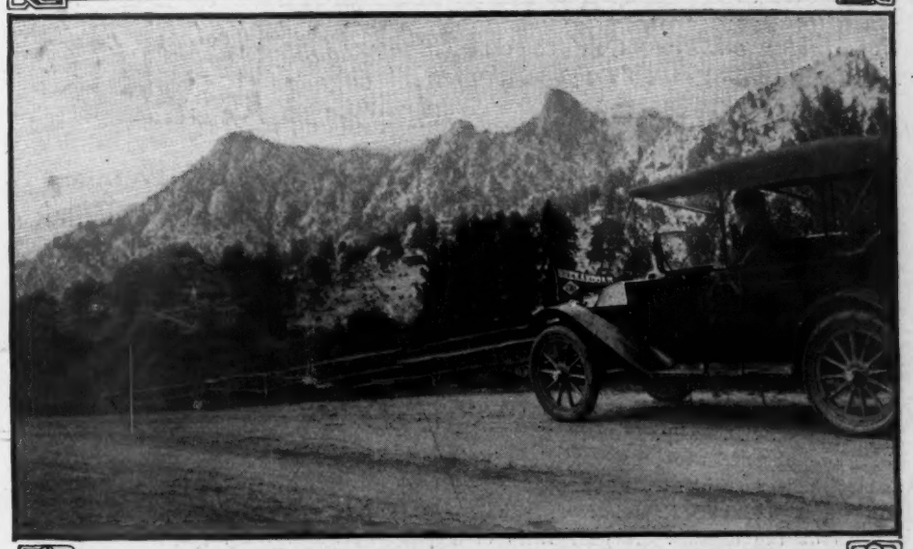
MEMPHIS—LOUISVILLE

Pine Bluff, Ark.—Editor Motor Age—Kindly inform me of the best route from Memphis, Tenn., to Louisville, Ky. Are the roads as good, and would it be much out of the way to go through Clarksville, Tenn.? I want to leave in about 2 weeks. Where can I get a Blue Book and what is the price?—W. F. Clark.

Your route to Nashville lies through Aulon, Whites, Germantown, Booth, Forest Hill, Bailey, Collierville, Pipertown, Rossville, Moscow, La Grange, Grand Junction, Saulsbury, Rogers Springs, Essary Springs, Corinth, Miss., Burnsville, Iuka, Cherokee, Ala., and Tuscumbia, being 160 miles; then between Tuscumbia and Nashville it is 122 miles by way of Sheffield, Florence, St. Florian, Green Hill, Loretto, Tenn., Pleasant Point, Dunn, Lawrenceburg, Crestview, Williamsville, Sandy Hook, Mt. Pleasant, Ridley, Columbia, Neapolis, Spring Hill, Brentwood and Nashville. There are 7 toll gates between Columbia and Nashville.

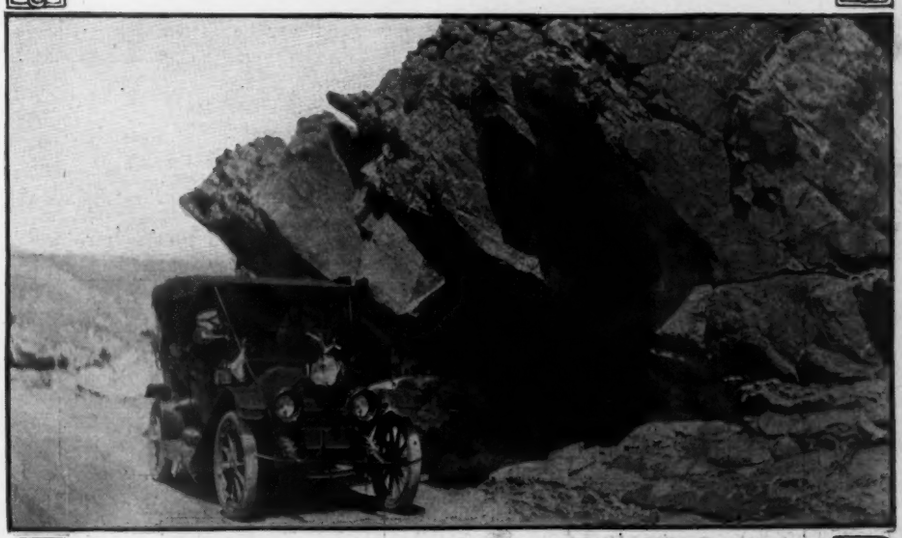
The Blue Book scouts in a recent report seem to prefer the road via Clarksville, Tenn., to the regular pike road to Louisville by way of Mammoth Cave. The first few miles out of Nashville are excellent macadam and you route through Ashland City to Clarksville, and 27 miles to Oak Grove, Longview, Square and Hopkinsville over a rolling country. To Henderson, Ky., it is all natural dirt roads through Crofton, Empire, Morton's Gap, Earlington, Madisonville and Henderson, a distance of 102 miles. There are two or three small fords which will give no serious difficulty except in very high water. The trip should not be attempted in wet weather due to the slippery clay soil which in some cases would make it bad going. To Owensboro through Zion, Hebbardsville and Sorgho it is 30 miles with but 14 macadam road. The best road although only fair dirt, takes you into Indiana and the routing to Louisville is Thomston, Yelvington, Powers, Rockport, Grand View, Troy, Don Juan, Leopold, Fredonia, Leavenworth, Wyandotte Cave, Corydon, Breckenridge, Laneville, Edwardsville, New Albany and Louisville. From Owensboro it is 140 miles and there are many interesting things to be seen. At Leavenworth along the base of the massive sandrock, on the west side of the road, is one of the wonders of the vicinity known as the Giant Castle ruins, and at Wyandotte there is 23 miles of weird and attractive underground avenues and caves.

The Blue Book does not cover this road.



BEST ROADS WERE FOUND IN THE MOUNTAIN COUNTRY

THE BURRO IS A SETTLED FEATURE OF THE ROCKY MOUNTAINS



ABOVE CANON CITY, COLO., ON THE SKYLINE DRIVE

To Build a Motor Bob

Small Home-Made Car to Use Motorcycle Engine Designed for Texas Boy

ACME, Tex.—Editor Motor Age—Do you think a motor bob would be practical with a 6 or 7-horsepower engine, and about what ratio would be best? About what speed would it give? Would it give 18 or 20 miles per hour, and would it have power enough to take a boy weighing about 85 pounds over fairly good roads? What would the motor cost, and where could I get one? I want it to go to school in. I have about 6 miles to go every morning.—A. B. Newby.

Motor bobs are not usually made with as much power as this, from 2½ to 4 horsepower being considered ample for the limitations of the chassis. A gear ratio of less than 7 to 1 is not to be advised. This would probably be sufficient to give you better than 20 miles per hour, which is faster than safety would permit. In all probability you could carry a load of 200 or 300 pounds with a good engine of this power, in a well constructed chassis. Motor Age is not in a position to give definite information on the cost of a motor of this type, and refers the writer to its classified columns.

The construction of a motor bob is no small undertaking, and as mistakes in design would prove very costly, Motor Age submits the following sketches and specifications. These are of course only tentative, and subject to modification in detail to adapt the design to available materials.

The design shown in Figs. 1, 2, 3, and 4, is for a light home-made cycle car, made, as near as possible throughout of standard hardware and plumbing fixtures. The wheelbase is short and the tread narrow, which permits of great strength with little weight. The motor should be of light weight. A standard motorcycle engine is best adapted to this use. It is situated to the rear of the back axle, and drives to the wheels through a chain-driven countershaft, and from thence by belts. The frame and axles are of standard 2-inch malleable pipe, and standard malleable unions. The front axle is rigid, and steers on a pivot. The wheels are 28-inch motorcycle wheels, with pneumatic tires. The frame is underslung, which not only saves complication, but greatly enhances the ease of riding, and is almost indispensable to safety, with a machine of this character. The springs are half-elliptic, being halves of old elliptic carriage springs.

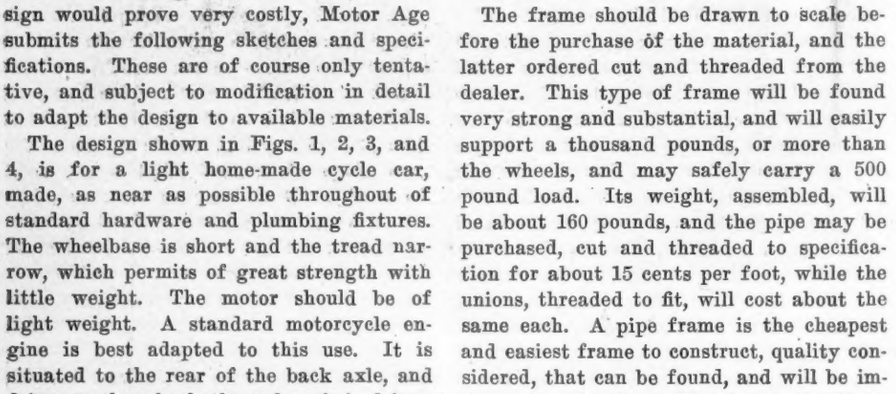


FIG. 2—FRONT AND REAR ELEVATIONS OF HOME-MADE CYCLE CAR

The Readers

Simple Cycle-Car Design—Fiat Fuel Feed—Speed of Chadwick at Jericho—Buick Adjustments and Lubrication —Milwaukee Makers of Tire Fillers

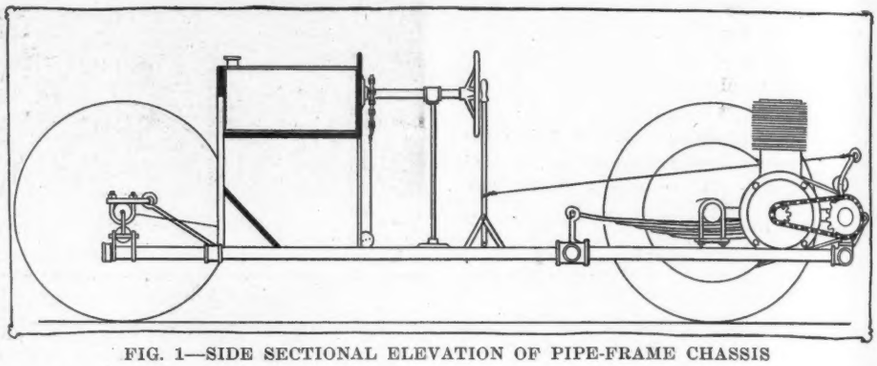


FIG. 1—SIDE SECTIONAL ELEVATION OF PIPE-FRAME CHASSIS

The frame should be drawn to scale before the purchase of the material, and the latter ordered cut and threaded from the dealer. This type of frame will be found very strong and substantial, and will easily support a thousand pounds, or more than the wheels, and may safely carry a 500 pound load. Its weight, assembled, will be about 160 pounds, and the pipe may be purchased, cut and threaded to specification for about 15 cents per foot, while the unions, threaded to fit, will cost about the same each. A pipe frame is the cheapest and easiest frame to construct, quality considered, that can be found, and will be immune to vibration. The frame should be of 2-inch pipe throughout.

The axles are of 1-inch pipe, the wheel spindles being welded or brazed to them by a blacksmith. The front axle pivot is shown in Fig. 4, detail A. Especial attention is called to the radius rod which extends from the front cross member of the frame to the top plate of the axle. This is indispensable, as with the type of steering used, the axle must be kept rigid. This rod and the plates, which any blacksmith will make at a nominal cost, are the only special parts to be made, the rest of the assembly consisting of a standard pipe hanger, and U-bolts. The short front cross spring, is made by cutting down a half-elliptic spring, obtained from an old elliptic carriage spring. It should be rather stiff.

No motor suspension is outlined in the drawings, as this detail must depend entirely upon the motor used. A good frame that will absorb a large part of the vibration is made of two pieces of 2 by 4-inch oak, secured to the pipe frame by U-bolts, with washers, next the wood. The countershaft is supported on the elevated bearings as shown in Fig. 4, C. These bearings consist of 2-inch Ts, bushed with cast babbit on the inside. In casting them, cores should be used, as shown in detail B, of Fig. 4, to save metal. When cast they should be reamed to exact size, to receive the countershaft. The countershaft presents a strictly machine-shop job, and should be made of a good grade of carbon steel 1 inch in size. The sheaves are keyed to the ends of the shaft, and the sprocket should be bolted to flanges keyed to the shaft. A pair of floor flanges will be found adaptable. The inner bearings are for the purpose of supporting the shaft, and the outside bearings, are secured to the radius tubes. Belt pulleys may be procured of any motorcycle parts dealer, and keyed to the shaft by a machinist. The belt is tightened or loosened to obtain a free-engine drive. For this purpose, a pair of jockey pulleys are mounted on the upper stretch of the belt. This is the reverse of motorcycle practice, because the

Clearing House

More Discussion of Cause of Motor Rocking with Unusal Crank Arrangement—Do Not Recharge Ford Magnets—Minnesota Motorist Is Maligned

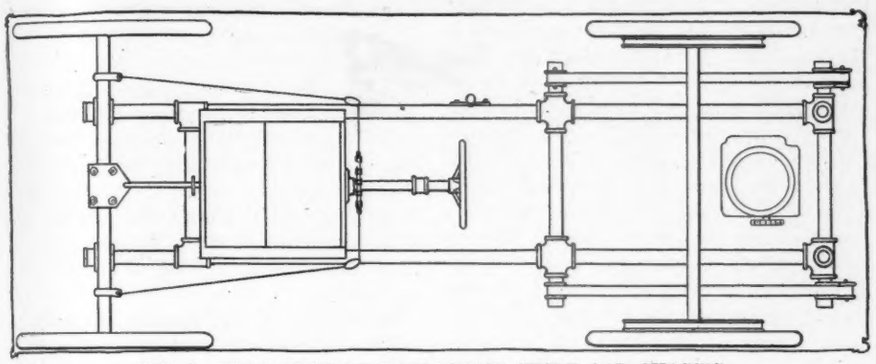


FIG. 3—PLAN VIEW OF PIPE-FRAME CYCLE CAR CHASSIS

pull side of the belt is on the lower side, due to the rear position of the countershaft. The brake should be in the form of a pair of faced shoes, to bear on the wheel sheaves, and connected by a small pipe or rod, across the car. The control of the jockey pulleys, and the brake is by rods or cables leading forward to levers or pedals, convenient to the reach of the driver. The most convenient and the simplest method would be to connect these cables on opposite sides of the pivot of a side-lever, so that when pushed forward, the belts are tightened, and when pulled backward, the brakes are set. Just enough slack should be allowed in the linkage to make the action of the lever neutral in the central position, so that neither cable is under tension.

Spark and throttle control may be most conveniently placed on the cowl dash, according to the latest 1913 fashion. The connections here will be simple and direct, and if the cowl is carried far enough back, will be within reach of the driver's hand. The crank should be fitted to the end of the countershaft, which should be arranged at the machine shop to receive it. The steering can best be managed with a horizontal steering pillar, with a hand wheel, the action being through a chain and sprocket, terminating in cables, attached to the front axle.

In this description, nothing has been said regarding the body. The best type of body to use is a sheet-metal flush-side type, as with a car as near the ground as this, protection from the mud of the road is indispensable. Available materials, and the individual preferences of the builder will have to dictate the style of body used, which may be made as simple or as elaborate as desired. It will be found convenient, however to carry the gasoline tank in the front, if possible, incorporating it with a dummy radiator, for the sake of appearance. The motor should not be covered, as to do so will impair its cooling.

The trimming and finish of the car can be made as simple or elaborate as the tastes and resources of the builder may dictate. Perforated sheet brass may be used to imitate the radiator.

RECHARGING FORD MAGNETS

Rockford, Ill.—Editor Motor Age—I would like some detailed information for making a simple device with which I could recharge the magnets of a model T Ford magneto without dismounting the magnets from the flywheel. I can use either storage batteries or 110-volt circuit, but am not clear as to the details of such a device.—Constant Reader.

Motor Age would not advise home charging of the magnets of the Ford magneto, except by an expert with a very complete equipment for such charging. The best plan, and probably the cheapest, would be to return them to your local factory branch or hire it done elsewhere. The Ford company does not advise recharging the magnets, for they do not hold their magnetism long after recharging, and new ones can be obtained at low cost.

Concerning Crank-Angle

More Comment on Cause of Bad Running Balance with Progressive Firing

SAINT ANSGAR, Iowa—Editor Motor Age—Replying to your reply to Chauffeur in Motor Age, October 3, regarding the angularity of cranks, it would seem that this subject is not as well understood as it should be by motorists in general, and I have seen statements by at least one manufacturer, which would tend to prove that he was not aware of the facts at the time of his writing, but later stated it was due to an oversight, when I called his attention to the matter.

The manufacturer who stated that the difficulty with motors which fire 1-2-3-4 was due to lack of balance of the moving parts instead of the firing order was right. Any one can prove this to his own satisfaction by bending a fairly heavy rod in the shape of two cranks with a bearing between them as in Fig. 5. Make the bearing long enough to have a grip with the hand, and leave the cranks about a foot in length, and of the same weight, so as to give a perfect standing balance. By rotating the rod rapidly, an effect will be produced exactly as represented by Fig. 3 in the article referred to. To carry the experiment further, make another form like the modern four cylinder, three bearing crank-shaft, and note that it will run rapidly without a couple.

Motor Age says that "By so designing the crankshaft that the firing order is more evenly distributed, the pressure is balanced, each alternate explosion bringing its pressure to bear on a different portion of the motor, instead of two explosions occurring at one end of the motor, and then two more at the opposite end." There are but two ways to fire the balanced motor, 1-2-4-3, and 1-3-4-2, and in both cases two explosions occur at one end of the motor and then two more at the other end. In the first, 2 follows 1 and 3 follows 4. In the last, 4 follows 3, and 1 follows 2.

A four-cylinder balanced motor, flexibly mounted in the frame, as the 1908 Franklin G. will show a vibration somewhat similar to a couple, except that the vibration is purely vertical, and is due to the two causes, viz.; action and reaction being equal, an explosion between the piston head and cylinder, will lift the cylinder

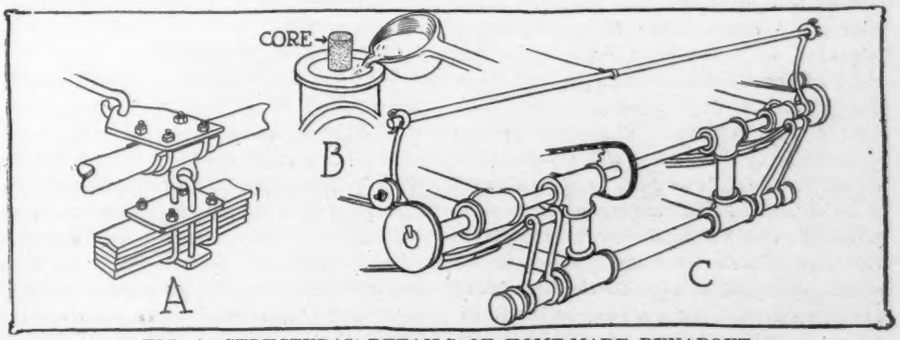


FIG. 4—STRUCTURAL DETAILS OF HOME-MADE RUNABOUT

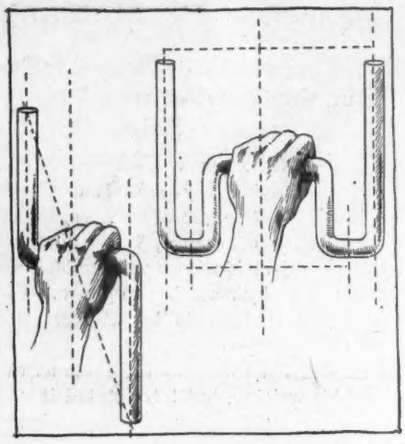


FIG. 5—CARROLL'S DEMONSTRATION OF CRANK-BALANCE

as well as force the piston down, due to the not very great difference between the two masses of metal. The front end has more movement than the rear, as the flywheel at the latter end, though revolving, adds its own weight to the relatively inert mass.

If a motor were made with two flywheels of equal weight, and placed equal distances from the ends of the cylinders, there would be a certain amount of vibration, based on the relative weights of the reciprocating and stationary masses, but it would be entirely vertical aside from the engine reaction, there being no remaining cause for a couple. It is an impossibility to build a vertical, four-cylinder balanced motor, and have it fire 1-2-3-4.—Guy B. Carroll.

As was discussed last week, a crankshaft arranged for progressive firing is very much out of running balance, due, as was then explained, to the different paths of centrifugal throw, of the cranks so arranged. The phantom lines which have been added to Mr. Carrol's figures show this tendency. The paths of centrifugal throw of the first, do not coincide nor balance, while those of the second are evenly balanced. This is conceded as a contributing factor to the imperfect balance of a progressive firing motor. That it is the principal cause of this condition, has not been proven.

In regard to consecutive firing of adjacent cylinders, Mr. Carroll's statement that in a standard motor this condition exists, is correct, but the effect differs from that of a progressive firing order, for the following reasons: the explosions in an alternate-crank motor occur in a progressive sequence, each explosion occuring in the next adjacent cylinder until the last cylinder is reached, when a jump is made back to the first cylinder. The effect on the crankshaft is that the power thrust is received in waves along its length without a break, with the tendency of violent tetering. In a standard motor, each revolution sees a jump from one cylinder to the second adjacent, so that on the first cylinder being fired, there is a jump to the third, which is followed by an explosion from the fourth. Instead of jumping back to the first from here, the next explosion occurs in number two cylinder, followed by number one.

It was stated in the criticism by Mr. Fried, which appeared in last week's issue, that a two-cycle four-cylinder crankshaft is always out running of balance. Analogous to this type of crank arrangement, is the crank action of the familiar locomotive. This crank arrangement is exactly like that of the two-cycle engine, except that as the steam cylinder is double-acting, one crank performs the function of two in the single-acting two-cycle engine. Such a crank arrangement is very much out of static balance as well as running balance, but is compensated for by the counterweights on the opposite portion of the drivewheels. Such a counter-balancing, if applied to the alternate-throw crankshaft would remove the lack of running balance, but would not balance the engine, as the wave-like application of power of consecutive firing would throw a motor out of balance, though it had the most perfectly balanced crankshaft possible. This difference is illustrated in Fig. 7.

In regard to Mr. Carroll's statement concerning flywheels, that the addition of a flywheel in front of the motor, at an equal distance from the motor as the rear flywheel, would augment any vibratory tendency, Motor Age must request that he make himself clear on this point. The effect of additional centrifugal inertia, would seem to have the tendency of decreasing the irregularities of the motor's balance. The gyroscopic action of an additional flywheel, would also exert an important influence in preventing the longitudinal rocking of the motor.

CHADWICK SPEED

Atlanta, Ga.—Editor Motor Age—The Chadwick people claim that one of their stock six runabouts, stripped, attained the speed of 112 miles an hour on the Jericho turnpike, a part of the old Vanderbilt cup course. Is this time recognized by the contest board of the A.A.A.?

2—Motor Age's foreign correspondent, in his description of the last French grand prix, states that the Bruce-Brown Fiat had a combined pressure and gravity feed system, which enabled the fuel supply to be replenished while the motor was running. Will Motor Age describe this?

3—Would like Willie Haupt's complete racing records? Also, his present employment and place of residence?

4—Who is the present amateur champion?—J. N. Brightwell.

1—There is no official record of it.

2—This system, shown in Fig. 6, of last week's isuse, consisted of a pressure system pure and simple, the tank of which was located higher than the float chamber of the carbureter, so that, with the filler cap off in refilling, the gasoline would still feed to the carbureter, which prevents the motor from stopping while the tanks are being filled, thus saving much valuable time. This is used generally.

3—Willie Haupt's best work was done at Wilkes-Barre, Pa., in the hill climb up Giant's Despair hill. He has not raced since 1909.

4—There is none.

CARE OF THE BUICK

Cleveland, Minn.—Editor Motor Age—I am driving a Buick model 43, 1912. What is the actual brake horsepower of the motor in this car?

2—What is the gear ratio?

3—What is the speed claimed for this car?

4—How is the steering gear adjusted to take up slack in the steering wheel?

5—What is the small plate for that is on the top of the driveshaft housing, just in front of the rear axle?

6—How often should the gearset and differential in this car be filled with grease? How much and what kind of grease should be used?

7—Is the Buick Motor Co. going to build a six for 1913?—A Subscriber.

1—35 horsepower at 1,000 revolutions per minute, and 49 horsepower at 1,500.

2—3½ to 1 on high gear.

3—60 miles per hour, with touring equipment.

4—Fig. 9 shows the Buick steering gear. Lost motion is taken up by turning nut A to the right. This draws down the upper thrust bearing onto the flange on the worm shaft, to take up wear.

5—The small plate to which you refer is for the purpose of packing the differential drive-pinion in grease.

6—Grease is put into the differential about once in 5,000 miles of running, on

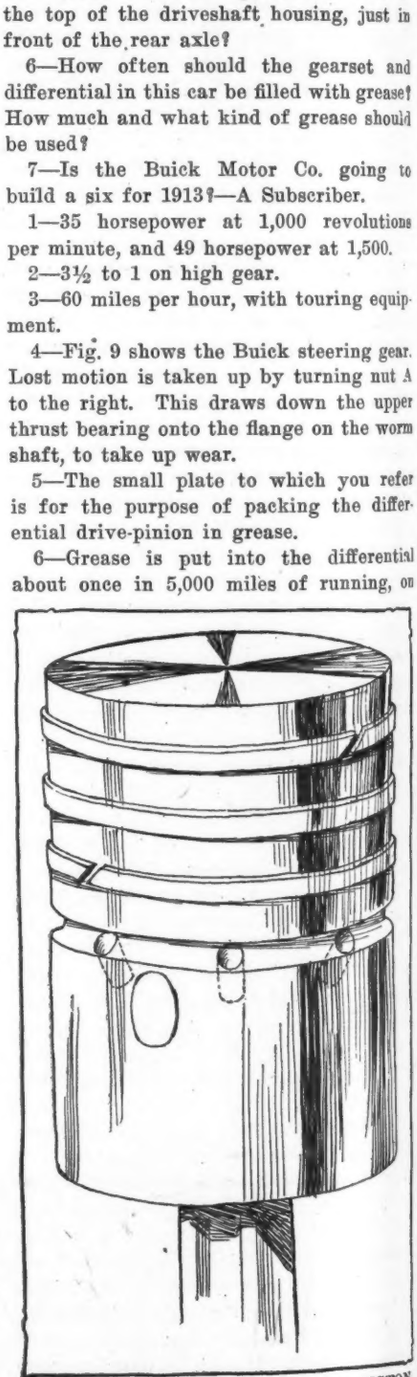


FIG. 6—OIL DRAINS IN BUICK PISTON

the average. It should be filled up to the overflow plug. This will be found to require from 3 to 5 pounds. The gearset is not packed in grease, but cylinder oil is put in to a height about even with the countershaft. This requires about 3 quarts of oil. The Buick company recommends cup grease for the differential and drive-pinion.

7—No announcement to this effect has been made.

BIG WHEELS ON FORD

LaGrange, Mo.—Editor Motor Age—Kindly inform me why a Ford model T cannot successfully be changed from 30 by 3⅛ to 32 by 3½-inch tires all around?

2—I would like the addresses of firms in Minneapolis, and Milwaukee, Wis., who manufacture a tire filler to replace the inner tube of tires.—W. C. O'Neal.

1—There is no reason why this change cannot be made, although it would not be wise under ordinary circumstances. The Ford car is intended to use 30 by 3½-inch tires, and every component part is especially designed for this size of tire. An increase of tire size would in the first place increase the gear ratio, so that the car would either be too highly geared, or else changes would have to be made in the gearing. These changes would be difficult, as the Ford rear axle is not designed for optional gears. The increase of the tire diameter by 2 inches would raise the car 1 inch in the air. This would lessen its stability, and prove rather awkward. The rear tire on its upper surface, and at the running board, would not more than just clear the mudguard. The wheels would not cramp so far in steering. Worse than any of these, however, the axles would be subjected to additional strains in rounding curves, and running on the down side of the road that would exceed the limit for which they were designed. This is illustrated in Fig. 8. The Ford design has been highly organized, and admits of very little change in structural features.

2—The Dahl tire filler is manufactured in Minneapolis, and is handled at a Milwaukee branch. Chemical rubber is manufactured at 322 East North avenue, Milwaukee.

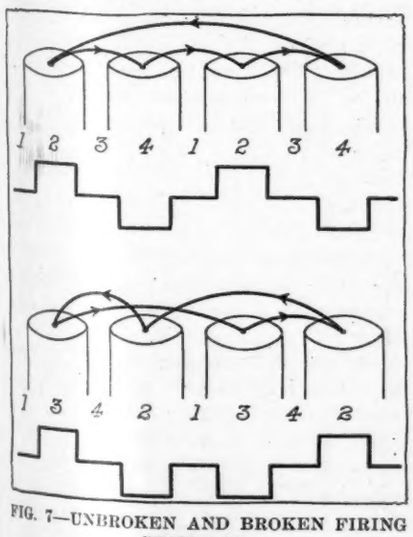


FIG. 7—UNBROKEN AND BROKEN FIRING SEQUENCE

CARPENTER CRITICISED

Buffalo, Minn.—Editor Motor Age—I noticed in the issue of September 26 that A. D. Carpenter thinks the reversible steering gear is the best all around type to have in a car. I have had experience with different kinds and I think the irreversible type is by far the best, the easiest to steer, and the safest. Mr. Carpenter says to turn a car with the irreversible gear one must exert a considerable power in order to turn the car as desired, and that it is much slower.

It seems to me that his irreversible must have been binding somewhere along the line. Now all modern reversible steering gears are back-geared to a more or less degree. If it were not it would be hard to hold onto a car going over rough roads. That the irreversible is slower in action shows that it is back-geared more than the reversible and the back-gearing gives one more purchase on the front wheels and makes it steer easier.

I think the irreversible is not very complicated. The better grades are exceedingly well built, the worm and sector devices inclosed in an oil-tight housing with an eccentric bushing to take up play between the worm and sector, and thrust bearing to take up the end play of the worm. Large and heavy cars frequently employ the reversible. The reversible is exceedingly cheap to make. I think any mechanic will agree with me on that point, and it is put on low-priced cars for the simple reason that in this day of fierce competition builders cheapen production in order to sell their wares.

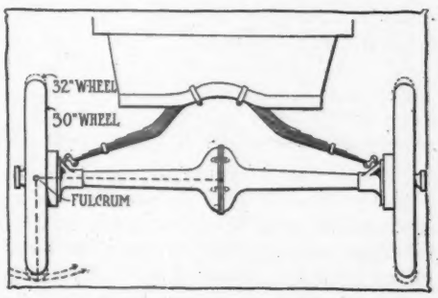


FIG. 8—EFFECT ON AXLE OF LARGER WHEELS

And, then, on the other hand there is real satisfaction in having an irreversible steering gear because one knows that one can take the hands off of the wheel for a second, if one so desires, without running into a ditch or a telephone pole. Should, perchance, a dog get in the way of the front wheels, one would have to hang on for dear life to keep the steering wheel from jerking away. Not so with the irreversible. One can scarcely feel it on the wheel. You will not find irreversible steering gears on cheap cars; the makers do not use them, for they are too expensive.

I think one should not compare the bicycle or motor cycle's easy steering qualities with those of a motor car, for the reason that the former have not the weight, and where there is no weight no effort is required to move the wheel or wheels. On a bicycle there is but one wheel to move and that is centrally disposed; on a motor car there are the front wheel offset from 3 to 4 inches from the king bolts. One might say that since both front wheels are offset, one balances the other, which is true. But let one front wheel meet with more resistance than the other and instantly this equilibrium is disturbed and there is a jerk at the reversible steering wheel, whereas on the irreversible this is entirely eliminated.—P. G. Liederbach.

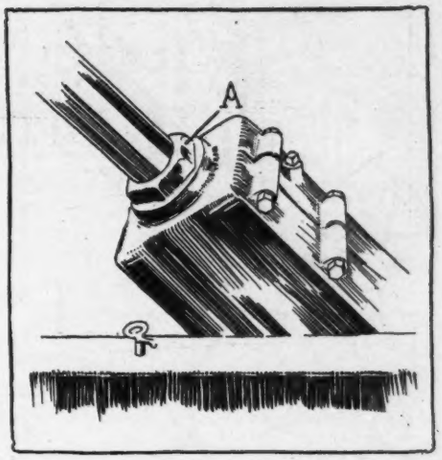


FIG. 9—BUICK STEERING ADJUSTMENT

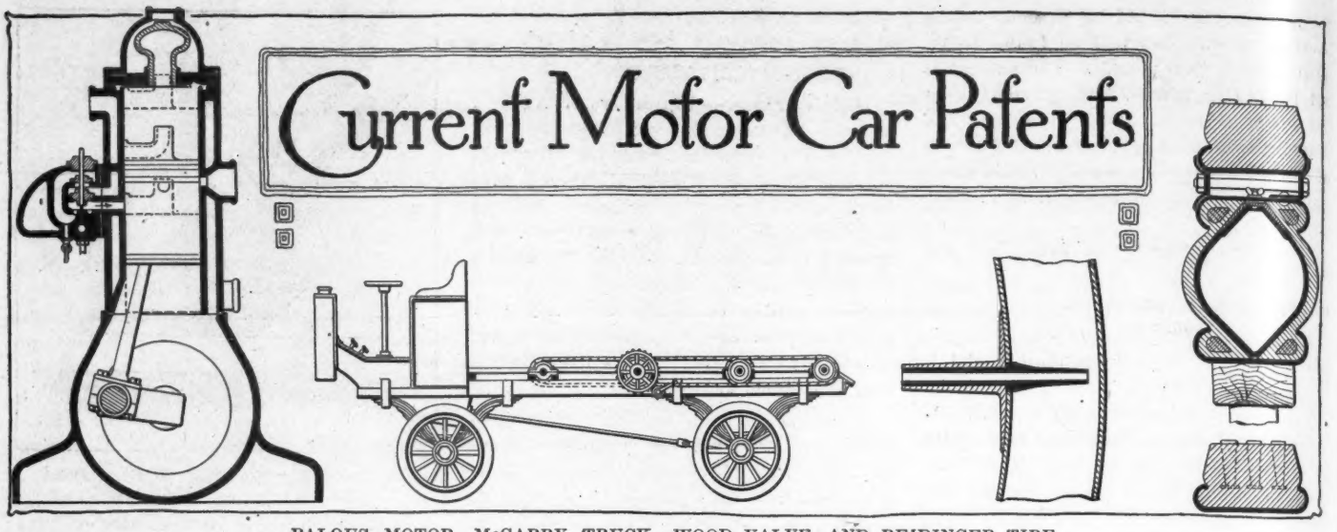
DRILLING PISTONS

Elma, Wis.—Editor Motor Age—In Motor Age, September 19, 1912, in the repair shop department there was published an item regarding drilling piston drains. Has this been tried out? Does Motor Age think it would be a good plan to drill the holes slanting down towards the inside?

2—About how many ¼-inch holes should one put in a piston on a 1908 model 10 Buick? The compression is good and I use Monogram heavy oil.—John Leybold.

1—Clamps such as described in the article to which you refer are not new, and are used successfully to hold cylindrical stock under the drill press where a simple efficient clamp is to be gotten up quickly for temporary jobs in practically all repair shops. Motor Age does not know of any specific case where they have been used for drilling pistons, as this job is a rare one, but can assure you that it will hold pistons as securely as any other cylinder.

2—The model 10 Buick should be drilled to drain oil as in Fig. 6. The holes in this case need not be more than ⅛-inch in size and about eight in number. The groove should be turned in a lathe, to facilitate the collection of oil, the holes being drilled through it at a downward angle. This is permissible with such small holes as specified, although if a ¼-inch drill is used, they should be slanted little, to facilitate the draining of oil.



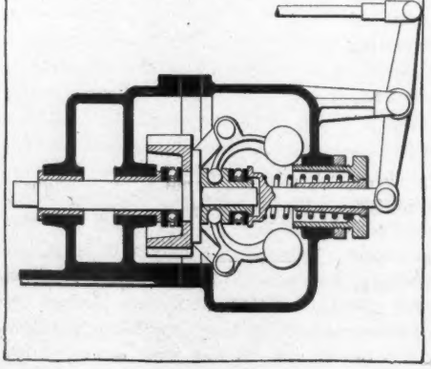
PALOUS MOTOR, McGARRY TRUCK, WOOD VALVE, AND REIDINGER TIRE

PACKARD Governor—No. 1,041,643—To Vincent Link, assignor, by mesne assignments to Packard Motor Car Co., Detroit, Mich. Filed June 9, 1908, dated October 15, 1912. This governor is to prevent the overspeeding of a truck, and is so constructed that it may be sealed by the manufacturers, in adjustment for a certain maximum speed, which the car cannot exceed unless the seals are broken, and the adjustment changed. It consists of a pair of revolving ball weights, secured to pivoted arms, the pivots of which are secured to a pair of levers which revolve with the shaft on which the governor is mounted. The inner portions of the arms are in the form of prongs, engaging with slots in a sliding sleeve about the shaft. Upon the balls being impelled outward in rotation, by centrifugal force, this sleeve is moved along the shaft by these prongs. Its movement is resisted by a spring which bears against a forked non-revolving shaft, which in turn bears on the end of the sleeve through a ball thrust bearing. This shaft is connected by a walking beam to the throttle of the engine, so that when the maximum speed is reached, and the balls are revolving in their widest path, the throttle is partially closed, so as to make further speed impossible.

Lumber Truck—No. 1,041,319—To John A. McGarry, Chicago, Ill. Filed January 11, 1911, dated October 15, 1912. To facilitate loading and unloading of lumber on a motor truck, this device consists of a number of transverse rollers on the loading platform, which are revolved by chains and sprockets, engine driven. Their direction of rotation is reversible, so that the load may either be moved forward in loading, or backward, in unloading.

English Punctureless Pneumatic—No. 1,041,350—To Eugene Richard Reidinger, London, England, assignor of one-half to Andrew Fraser, London, England. Filed July 2, 1912, dated October 15, 1912. The principle upon which this tire operates is the same as similar inventions in this country. The difference is that most of the American solid-pneumatic combinations allow the solid or tread element a certain amount of deformation. On the Reidinger tire, however, the tread is secured to a solid steel demountable rim, and has no provision for encompassing road obstacles, but must roll over them. The pneumatic element is disposed between this rim and the felloe of the wheel. It consists of an outer shoe of a double-tube inflatable pneumatic cushion, which instead of having a tread at its outer periphery, is provided with a clincher bead, identical, except as to size with the inner bead. Clincher rims hold the tire on both beads. This construction makes the tire very substantial, thus removing an objection that has heretofore obtained to this type of tire. The treads are removable.

German Two-Cycle Motor—No. 1,041,154—To Leon Palous, Berlin, Germany. Filed Dec. 26, 1911, dated October 15, 1912. Integral with the cylinder, the mixer of carbureter of this engine is its feature. The engine is of the single-bore, crankcase compression type, with the inlet and exhaust valves situated on opposite sides of the cylinder, uncovered by the piston at the lower portion of its down stroke. The inlet is through a passage in the piston, and out through a vertical nozzle. The mixer consists of three valve chambers, the upper of which communicates with the air intake, the middle of which with the compression space, and the lower, with the inlet port in the cylinder. The valve is situated in the middle chamber, adapted to alternately close the upper and lower chamber from communication therewith. The lower portion of its stem terminates in a needle valve, seating in a fuel nozzle. On the down stroke of the piston, the air in the crankcase is compressed. At the bottom of the stroke, the intake valve is uncovered, permitting the air to pass through the valve from the middle chamber into the lower. The raising of the valve, raises the needle valve, and allows a spray of fuel to mix with the inrushing air. On the upstroke of the piston, a suction is created in the crankcase, and the valve closes the opening into the lower chamber, admitting air from the upper chamber through the middle chamber into the crankcase. The advantages to be gained by this valve construction are, crankcase compression, without condensation of the charge, as only pure air is compressed in the crankcase, the fuel being mixed with the compressed air just before its intake into the cylinder so that the charge is always prime; the passage through the piston both warms the gas and cools the piston, while the nozzle form of the piston port, projects the gas at once to the top of the cylinder, forcing the burned gases out with the minimum of mixing.



PACKARD GOVERNOR

Automatic Rubber Tire Valve—No. 1,041,216—To Pinkney P. Wood, Hot Springs, Ark. Filed May 2, 1911, dated October 15, 1912. Depending upon the shape and character of the material used in its construction, this valve consists of a simple conical rubber tube, which is a continuation of the valve stem, within the inner tube, which opens upon the pressure from without exceeding that within, and is closed by the pressure within, when that without is exceeded by that within. The advantages of this form of tire valve, assuming that its operation is as expected, are simplicity, lack of resistance in inflating the tire, large diameter of passage, and cheapness.

The Motor Car Repair Shop

Removing Connecting Rod Bushings

THE piston-pin end of a connecting-rod generally is non-adjustable, the piston-pin bearing usually being of bronze which when worn requires the refitting of a new bushing. The refitting of a connecting-rod bushing is not a difficult operation when suitable tools are at hand; but without them, or some convenient makeshift, the operation is not easy. The tools desirable for refitting bushings include a puller for removing the worn bushing, a block of wood, preferably hard wood, and a hammer to drive the new bushing into place, and a reamer to facilitate fitting the pin into the bushing. It might be well to mention that in fitting a new bushing, it generally is wise to fit a new pin also, as the old pin is quite likely to be worn out of round; and a worn pin cannot be readily trued up again because, being case-hardened, a grinder is required, and even if a grinder is available as the case-hardened portion is quite thin, the grinder might bite into the softer metal below, so that the pin would be very short lived and require that the motor be again laid up for untimely repairs and a new pin fitted.

One common way to remove a bushing is shown in Fig. 1. The jaws J of vise are opened just far enough so that the end of the rod R may rest upon them and at the same time give sufficient clearance for the bushing to pass between them as it is driven out. To drive out the bushing B, a drift D and a hammer are required as indicated. The drift is usually a round bar of steel.

A better way to remove such a bushing is illustrated in Fig. 2. The jaws J of the vise are opened wide, a piece of pipe P, just large enough to clear the bushing, is placed against the inner surface of one jaw, the rod is carefully adjusted and pressed against it to hold it in place until the drift or solid pin N is adjusted into place, then one has but to draw the jaws of the vise together to squeeze the bushing out of the rod R into the pipe P.

When it is required to remove a bushing from a rod that is not dis-assembled from the engine, a bolt B, some washers W, a piece of pipe P, a nut N, and a wrench H may be employed as shown in Fig. 3.

With this equipment, which generally is to be found in the scrap heap of almost any repair shop, a bushing may be removed without the danger of springing or burring up the connecting-rod end.

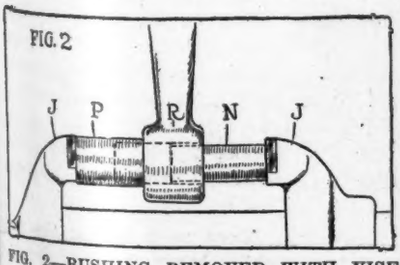


FIG. 2—BUSHING REMOVED WITH VISE

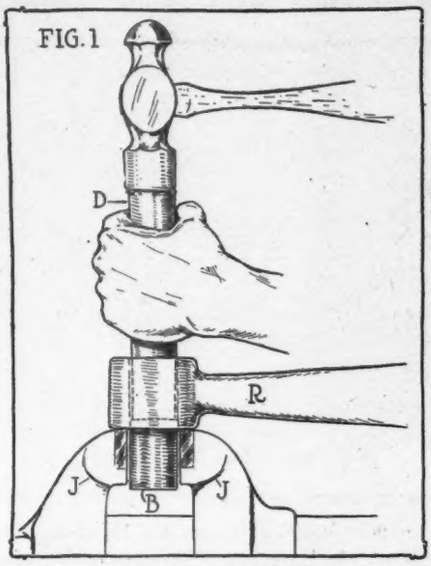


FIG. 1—REMOVING CONNECTING ROD BUSHING WITH A HAMMER

Adjusting a Disk Clutch

There are a number of cars in use having disk clutches on which the adjustment of the clutch is made by means of a series of three or more separate studs or screws. Much trouble often is experienced by motorists who try to adjust this type of a clutch without a knowledge of how it should be done. The proper way to adjust this type of a clutch is to screw the studs back, or release them entirely from contact with the plate or mechanism inside the clutch casing, then screw them up carefully with the fingers until each one just begins to touch, which is indicated by an increase in the effort required.

When each screw or stud has been turned up so that it just begins to touch the plate or mechanism against which it bears on the inside of the clutch casing, then with the aid of a wrench, give each screw a half-turn forward and repeat, until the proper adjustment is obtained. The object is to give each screw the same number of turns and at the same time have them all move forward at practically the same time. If one was to give one screw five or six full turns and proceed to the next one and give it the same number of turns, etc., until all had been turned up the same amount, the same results might be obtained; but it is most probable that the job would not be successful, and perhaps damage to the internal mechanism of the clutch would ensue as a result of possible binding or cracking. On the other hand, if the studs were screwed alternately, little by little, but no care given to the relative number of turns given to each, the springs or operating mechanism would most likely bear unevenly upon the disks, and a jerky, grabbing or slipping action of the clutch would result.

When an inclosed disk clutch which runs in oil has been giving good service for a reasonable length of time and then develops a tendency to slip, or perhaps to take hold too fiercely, the trouble should not be taken immediately for an indication that the clutch is in need of adjustment. Before altering the adjustment of a clutch of this type, one should first drain out the old oil, inject a pint or more of kerosene, preferably with a squirt gun, then close the opening to the casing, start the engine, and with the gear-shifting lever in the neutral position, operate the clutch pedal so the kerosene may be thoroughly distributed and the internal mechanism of the clutch well rinsed and cleared of old and sticky oil. Then drain the clutch casing, flush it out once or twice with fresh, clean kerosene, and refill to the required amount with clean oil.

If after this treatment the clutch still slips, draw out a little of the oil and replace the amount taken out with kerosene; by thinning the oil in this way better contact between the plates is obtained and slipping is reduced. Unless the proper proportions of oil and kerosene are known, the lubricant may have to be thinned down gradually until the proper mixture is obtained; but once found, the extra trouble is rewarded by a fine, smooth action.

Should it be found slipping it cannot be eliminated by means of thinning the lubricant, then an increased spring tension may be required which can be obtained by tightening or screwing up all adjusting studs evenly all around. It is good motor practice never to disturb an adjustment unless an absolute knowledge of the operation and effect of the adjustment.

When a clutch of the multiple-disk type running in oil takes hold too fiercely, drain out the oil, rinse with kerosene as previously described, and refill to the required amount with clean, fresh oil; if this does not prove a remedy, readjust the clutch by loosening all studs entirely and then tightening them until best action is obtained.

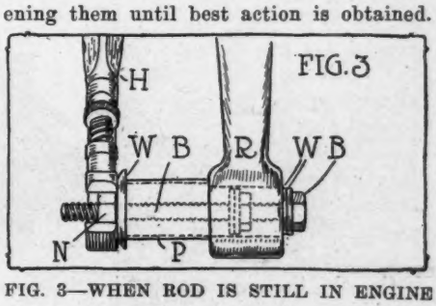


FIG. 3—WHEN ROD IS STILL IN ENGINE

Americans Gain Glory Abroad

Case and International Harvester Tractors Prominent in French Plowing Trials Held Recently at Bourges

CASE STEAMER AS IT APPEARED IN PLOWING TRIALS AT BOURGES, FRANCE

By W. F. Bradley

FRANCE and America have just competed in the most important plowing competition held in France, in which honors were very evenly divided. The event, put on foot at Bourges by the Central Automobile Club, with the assistance of the agricultural commission of the Automobile Club of France, united twelve machines of widely different types, nine of the machines taking part in the tests.

The competition was decided on the amount of plowing done, the depth attained, ease of operation, fuel cost, and freedom from breakdowns. Owing, however, to the machines varying enormously in original cost, amount of work they were able to perform and number of men required to handle them, it was a difficult matter to class them in order of merit.

On the first day the ground was bad, having a stony subsoil into which the plows stuck as soon as they attempted to reach a reasonable depth. On the second day the ground was heavy, but with a much greater depth of soil. The third day, which should have been devoted to deep plowing, was changed into a demonstration, for it was found that the ground, which had been offered by a local farmer, was so bad that no machines cared to tackle it on a competitive basis. It afterwards transpired that having very great difficulty in plowing this land to any depth by the use of horses or oxen, the farmer had conceived the idea of letting the motor machines work on it, but had neglected to state its particularly difficult nature to the committee. The ground was not uniform; thus the weak machines withdrew altogether, and the more competent appliances were held back on the ground that if they got a bad patch an unfavorable impression would be created among the public.

Considered from a fuel cost basis only, the most successful machine was the J. I. Case company's steam tractor, an American machine, which worked at the rate of 52 cents per acre, using compressed coal bricks of the type commonly employed on the French railroads. This was the only steamer in the competition, all the others being of the internal combustion type, and all running on benzol, with one exception. As an offset against the low fuel price of the Case steamer must be set the fact that it employed three men, while practically all the other machines worked with either one or two operators.

The next in order of merit on a cost basis was the De Mesmay at 74 cents per acre. There was no comparison, however, between this machine and the American, for while the latter did deep plowing, and a large amount of it, the French appliance was really only a motor hoe which, with a two-blade plow attached, did mere surface plowing. Very closely placed after these two were the Lefebvre caterpillar type plow, at $1.16 per acre, the Bajac at $1.20, the Filtz at $1.22 and the International Harvester Co.'s machine at $1.50. All these did really satisfactory work, but with so many other factors to consider it would not be equitable to judge of their value on a fuel cost only. The remainder cannot be considered very practical machines, for the fuel cost varied.

FILTZ PLOW AT WORK

The two American machines were the respective firm's standard models, the Case being the company's 30-horsepower steam tractor hauling a platform with eight plows, and the International Harvester machine being the 25-horsepower single-cylinder gasoline tractor working with five plows.

Bajac, Lefebvre and Filtz gave about equally good results, although representing three entirely different types of machines. The Bajac, which is built by the Bajac company in conjunction with the de Dion-Bouton company, is a tractor with a winding drum having a sufficient length of cable to haul a plow across a field about 100 yards in length. The tractor carries its motor, a four-cylinder of 35 horsepower identical with those used on the Paris omnibuses, forward under a bonnet, transmits through a clutch and a propeller shaft to a combined gearbox and differential housing, and takes final drive by transverse shafts having pinions meshing with internal gears on the large diameter road wheels. The propeller shaft is continued rearwards and drives a vertical shaft on which is mounted the winding drum, this latter being immediately under the platform body.

Used as a tractor the machine has a speed of 6 to 8 miles an hour; its plowing

speed is from 2¼ to 3 miles an hour, according to the nature of the ground. As the tractor has to place itself on the opposite end of the ground to that occupied by the plow, and haul this latter to it, a quick automatic locking arrangement is necessary. This is obtained by a couple of stout triangular frames through the base member of which projects a stout steel prod. Suspended at the rear, these two frames can be raised and lowered by means of a winding drum operated by the driver, and when lowered one of the sides of the triangle is in contact with the road wheel and another is on the ground. By backing a short distance, the prod is forced into the ground and the greater the strain on the cable the more tightly the rear wheels are wedged. A certain amount of time is naturally lost in running backwards and forwards on the field, but the losses are reduced to the minimum by the automatic locking device. The machine requires two men, one on the tractor and the other working the balanced plow.

LEFEBVRE, A THREE-PLOW MACHINE

The Lefebvre is a direct-hauler, being a three-wheel tractor to which a balanced plow is attached. The motor is in front under a bonnet, and the single steering wheel is controlled by means of an inclined steering column, with worm and sector. The machine is distinctive by reason of a caterpillar device for securing traction on soft ground. Normally, when running on roads or on hard earth, the drive is taken through to the rear wheels, but when plowing the machine hauls itself along by means of a couple of endless bands, each one surrounding a heavy roller chain and having projecting blades or paddles. On the jackshaft, carried behind the rear axle, there are two chain sprockets, one transmitting the drive to the live axle, and the other, only brought into use when plowing, carrying the power to a large chain sprocket on each side of the tractor. The tractor is provided with an external trussed frame, the fore end of which can be raised or lowered by a worm and screw, belt driven off the motor; at the front end of this frame is a sprocket of the same diameter as the rear one, and a chain surrounding the two. Around the chain, and attached to it, is a broad leather band carrying the projecting blades already mentioned. The front end of the frame being lowered, the blades enter the ground and by the rotation of the chains drive the machine ahead.

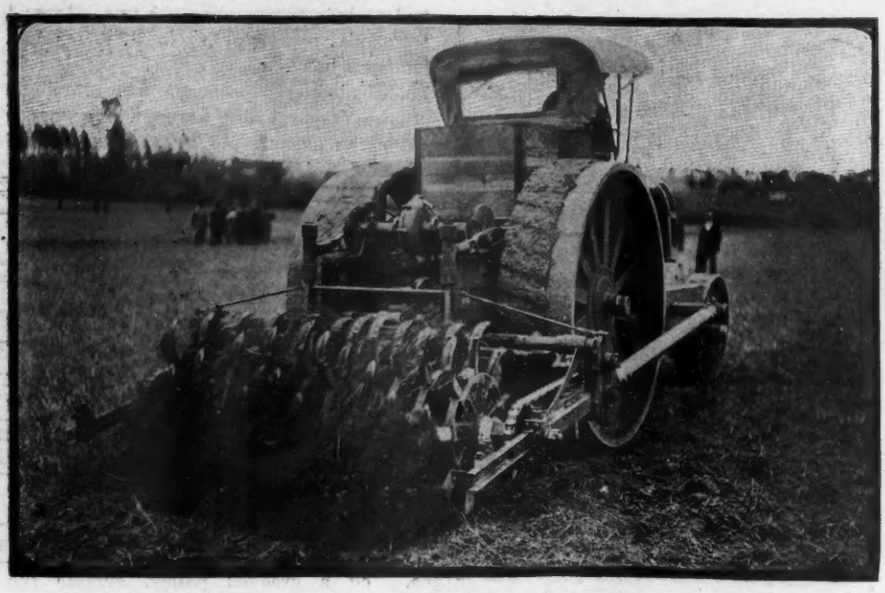
The Filtz machine is a four-wheel bogey carrying a 25-horsepower gasoline motor under a bonnet, having the driver's seat in the center and the radiator at the extreme rear. Through a cone clutch the power is transmitted to a propeller shaft, a pinion on the extremity of which engages with a crown bevel gear on a transverse shaft. There are two crown wheels on this shaft, with an arrangement for bringing either one of the other into engagement with the driving pinion. On one end of the jackshaft is mounted a grooved pulley, outside the frame member, and there is a second and similar idler pulley also outside the frame member.

A fixed cable rigidly attached to each extremity of the land to be plowed is given four or five turns around these two pulleys and according to which pinion is in engagement the machine will haul itself and its plow across the field in either direction. The tractor is light and simple, but it is not self-propelling. Three men are required, one being on the tractor and one at each end of the field to maintain the tension on the cable and haul the bogey to which the extremities of the cable are attached. The bogey has disk wheels and a couple of winding drums with ratchet, one being for the plowing

RESULTS IN PLOWING COMPETITION AT BOURGES, FRANCE, PARTICIPATED IN BY AMERICANS

Machine		Width land plowed	Speed in m.p.h.	Depth in inches	Area plowed, acres	Men employ'd	Fuel used	Fuel used, gals.	Working time, H. M.	Total stops, min.	Fuel cons., acre, gals.	Fuel cost per acre†
International Harvester Co.	First day....	74 in. 5 plows	2.2	6 to 8.2 aver. 7	3.7	2	Benzol ...	11.6	5:34	0	4.1	$1.50
	Second day..		2.6	7 to 9.4 aver. 8.2	2.5	2	Benzol ...	14.3	2:47	25		
Bajac	First day....	48 in. 4 plows	*2.9	4 to 6.6 aver. 5.6	3.6	2	Benzol ...	11.6	5:14	22	3.3	$1.20
	Second day..		2.2	5.2 to 6 aver. 5.6	2.2	2	Benzol ...	7.8	3:35	20		
Lefebvre	First day....	31 in. 3 plows	2.5	6 to 8.2 aver. 7	3.9	2 or 4	Benzol ...	10.4	4:37	20	3.19	$1.16
	Second day..		2.1	7 to 9.4 aver. 8.2	2.3		Benzol ...	9.7	3:54	41		
Filtz	First day....	27.5 in. 4 plows	2.8	4 to 5.6 aver. 4.8	1.1	3	Benzol ...	4.4	4:14	28	3.4	$1.22
	Second day..		2.9	5.6 to 7 aver. 6.3	2.0	3	Benzol ...	6.3	4:13	34		
Motoculture Francaise.....	First day....	78 in. 100 hooks	0.39	2.7 to 6.2 aver. 4	1.03	1	Benzol ...	10.3	3:45	0	9.91	$3.60
	Second day..		.....	4.4 to 4.8 aver.4.7	0.29	1	Benzol ...	.....	1:40	64		
Vermond & Quellennec.....	First day....	66 in. 99 picks	0.86	4 to 7.4 aver. 5.2	1.8	1	Benzol ...	13.5	5:13	0	7.04	$2.62
	Second day..		.....	6 to 7 aver. 6.3	0.71	1	Benzol ...	.....	.....	Many		
Gilbert	First day....	19.5 in. 2 plows	1.6	2.4 to 4.7 aver. 3.2	.....	2	Gasoline ..	1.6	0:44	Many	11.4	$5.20
	Second day..		1.7	2 to 2.3 aver. 2.1	.....	2	Gasoline ..	.....	0:58	Many		
De Mesmay.....	First day....	19.5 in. 2 plows	0.31	Surface plowing	4.4	2	Benzol ...	4.1	3:20	28	.....	$0.74
	Second day..		.....	.....	4.0	2	Benzol ...	1.6	2:40	4		
Case steamer.....	First day....	88 in. 6 or 8 plows	2.6	5.2 to 7 aver. 6.2	4.4	3	Coal bricks	947	3:20	15	‡638	$0.52
	Second day..		2.2	5.5 to 7.4 aver. 6.3	4.0	3	Coal bricks	661	2:40	0	‡479	

*Speed of tractor only, 6 to 8 miles an hour. †Benzol at 40 cm. per liter; gasoline at 50 cm.; coal at 38 frs. per ton. ‡Water used, gallons



VERMOND & QUELLENNEC ROTARY PLOW IN OPERATION AT BOURGES

cable and the other to haul the bogey along the field as the furrows are traced.

Three different types of rotary plows were presented, but not one of them went completely through the two days' test. The Motoculture Française, the lightest and simplest of the three, carries a three-cylinder gasoline motor set across the frame, with single chain drive to the road wheel and a second chain drive from the rear axle to a second shaft having 100 flexible hooks mounted on it. Both chains are inclosed and a device is provided for raising or lowering the shaft carrying the plows.

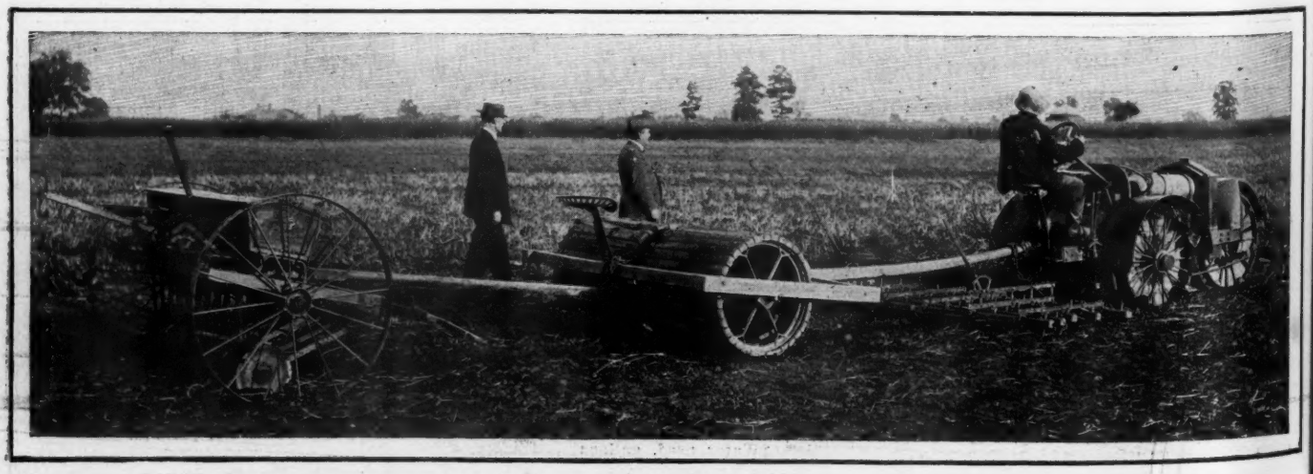
The distinctiveness of the apparatus lies in the fact that the ground is turned up by a set of flexible-spring-mounted hooks, rather than picks, of such a nature that they will bend if brought in contact with a hard object. The plowing rate of the machine is very slow, being less than ½ mile an hour, working on a width of 78 inches. The machine might be suitable for soft ground, but was defective in heavy and stony earth. When it got on to the heavy clay soil of the second day it was unable to obtain traction. The motor, too, was underpowered, the engine continually overheating.

There were two Vermond & Quellennec machines, similar in principle but differing considerably in construction. Only one actually plowed, the other being held up first by mechanical troubles, then by reason of its inability to get over the soft ground to the field. The more successful of the two was a Schneider four-cylinder motor of about 4 by 5, similar to the motors used on the Schneider buses in Paris. It drives the rear wheels through a clutch, gearset and jackshaft meshing with an internal gear on the rear wheels. In addition a second jackshaft is driven off the rear extension of the propeller shaft and carries a sprocket at each end from which the power of the motor of the tractor is taken to the pick shaft by means of chains.

The plowing in this case is done by very heavy, rigid picks, ninety-nine in number, mounted on the rear shaft. The speed is under a mile an hour, for a width of 66 inches, and although the depth attained is fairly satisfactory, with the 35 horsepower available the machine cannot be considered a success, for the motor was constantly overdriven, was overheating, and was frequently on the point of being stalled.

The De Mesmay and Gilbert machines are only of value for small work. They have very little power, the former having a single-cylinder motor, which is really

INTERNATIONAL HARVESTER TRACTOR PERFORMING AT BOURGES



LAMBERT STEEL-HOOF MOTOR TRACTOR HARROWIN G, ROLLING AND DRILLING IN ONE OPERATION

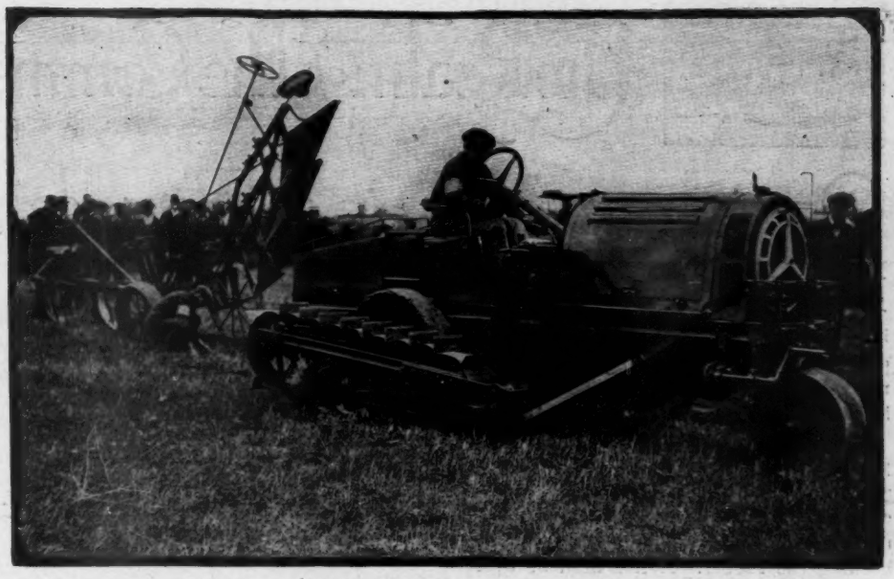
only designed to work a motor hoe, and the latter having a twin-cylinder motor driving a single wheel and obtaining its traction by reason of a series of eccentrically-mounted blades projecting through slots in the ring of the wheel. This mechanism gave trouble, and deprived of its blades the machine was unable to get sufficient traction to haul a plow.

The plowing was watched by a large number of farmers and also by an official delegation from the Paris municipality interested in motor plowing for the city's sewage farm. Conditions were arduous, but real work was done and orders were placed for motor plows. Both the Case and the International Harvester companies report that several of its plows are now working on French farms.

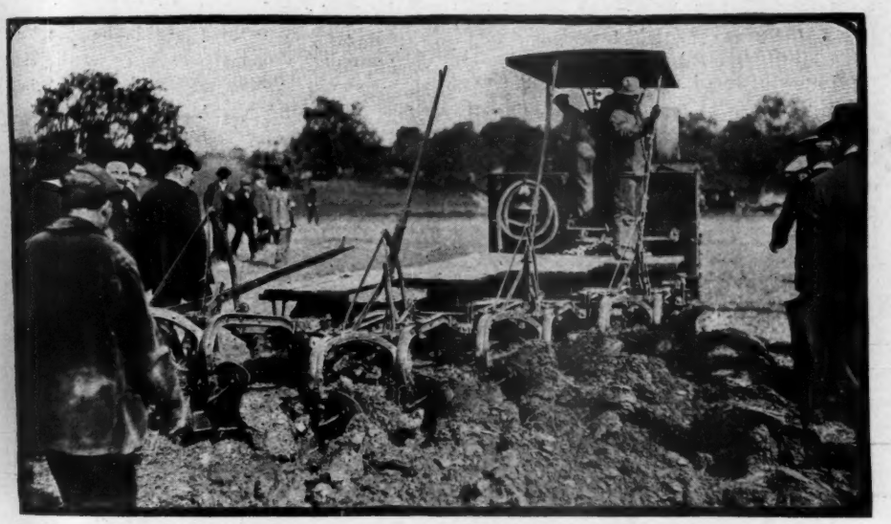
LAMBERT'S STEEL-HOOF TRACTOR

The Buckeye Mfg. Co., maker of the Lambert friction-drive car, has brought out a farm tractor, which previously has been illustrated in Motor Age. It is called the steel-hoof tractor, deriving the name from the fact that the wheels are equipped with steel cleats which engage loose earth much in the manner as do the hoofs of a horse and gives the machine great tractor power in loose, loamy soil. While it is designed for orchard work, it also can be used on roads and paved streets as a tractor. On such roads pneumatic tires take the place of the steel hoofs. The hoofs are still there, though engaging when the tractor strikes loose dirt, when the pneumatic tires sink into the ground. The tractor is only 50 inches high and 11 feet long, which enables it to work up close under the trees without injuring the low-hanging branches.

The Buckeye people also point out that the tractor also solves the problem that confronts the road builder who no longer is forced to depend upon horses. It can be hitched to plows or grades and when the grade is finished it can deliver from 8 to 10 yards of stone or gravel per load on the grade and in half the time required to do the same work with horses.



LEFEBVRE CATERPILLAR MACHINE DEMONSTRATION AT BOURGES



CASE, AN AMERICAN MACHINE USING SIX PLOWS

USING MOTOR HAND CARS

The Missouri, Kansas and Texas Railroad is equipping many of its hand cars with gasoline motors. It is planned to install these motors upon all of the hand cars that are in use upon the system. The first division to be equipped with the motor hand cars is that between Denison and Fort Worth, Texas. It is stated that it is a comparatively easy matter to motorize the old type of hand cars.

LAMBERT STEEL-HOOF MOTOR TRACTOR AS EMPLOYED IN ROAD BUILDING WORK

The Realm of The Commercial Car

Overloading and Truck Body Design

Factors that Figure in This Abuse, Causing Extra Tire Wear

By William B. Stout

NOTHING so quickly ruins tires as overloading. Overloading often is due to improper body design. Many times it is due to the truck being too light for the route it is to cover. Sometimes the overloading is the fault of the chauffeur.

Loads not too heavy at low speeds may put an overload on the tires at higher speeds. Tires may be injured directly by overloading through road wear, or indirectly by the body rubbing on them and burning the rubber. A tire need be overloaded but once to spoil its structure. Further use will but bring about its disintegration.

Of a number of cases of overloading noted on a recent date by the writer 50 per cent were due to body design unfitted for the work in hand.

The truck of a piano delivery concern was noted first. This was a 3-ton capacity gasoline truck with an inclosed body, wide doors being left on either side. These doors were just wide enough to take two pianos in their boxes, setting side by side. Between the front edge of the door and the front end of the body was a space of 18 inches or more as at G Fig. 1. This unhandy space caused the overload.

Case of Bad Loading

On several different occasions this machine was noted and always seen loaded as in Fig. 1. The two pianos first put on went into the side doors crosswise of the car. After that two more were set back of these lengthwise of the car, mostly on the tailboard of the body so that more than half of the live load was at the rear of the axle, or point of tire road contact. This loading threw an unusual amount of weight on the rear tires and a closer view of the truck was sought.

The tires were found to be in a very poor condition although the machine itself looked new, having been in operation about 5 months. The block tires on the rear were fearfully chewed up, chips of rubber being broken off the edges of the blocks, giving them a frayed appearance. There was no fault in the tires as they were of a make well known for long wear. The fault was in the custom of overloading.

If the four pianos, which made a load every time noted, had been properly distributed forward the tires would have had a great deal less weight to support, in the opinion of the writer.

To move the pianos to the forward end of the body would require a deal of extra work on the part of the drivers, at least there is enough extra in working the box into this small space forward to keep the drivers from doing it as a general thing. If the piano boxes were all put in endwise then the first one put in would block the side doors for the next one and all the load would have to go on from the rear. By sliding the piano boxes in crosswise, as shown, there was no moving to do after the box was on, making it much easier for the driver and helpers. To get a piano out of the end corner after it was once put in would be a job as well, meaning the moving of other pianos before it could be moved off, unless the order of delivery were noted as the pianos were loaded, which seems to be rarely done, when this could be taken off last.

Balancing Load Correctly

Had the doors at the side been cut at the extreme front of the body at the side the present system of loading would balance the load correctly. This present method of loading is very handy from the driver's standpoint, as any one piano can be taken off without hindering others. It is bad for tires however, and this fact is due as stated before to body design. Another body incorrectly built was seen recently on a converted touring car which reminds the writer of the story of a workman in a different line of work than cabinet making, who, working at home at nights made for himself a new toolbox in which he took great pride. On appearing at the factory with it one morning at the plant ready to fill it with his tools the foreman of the pattern shop happened by and noticed the box the workman was carrying.

"Hello Tom," said he, "What you got there?"

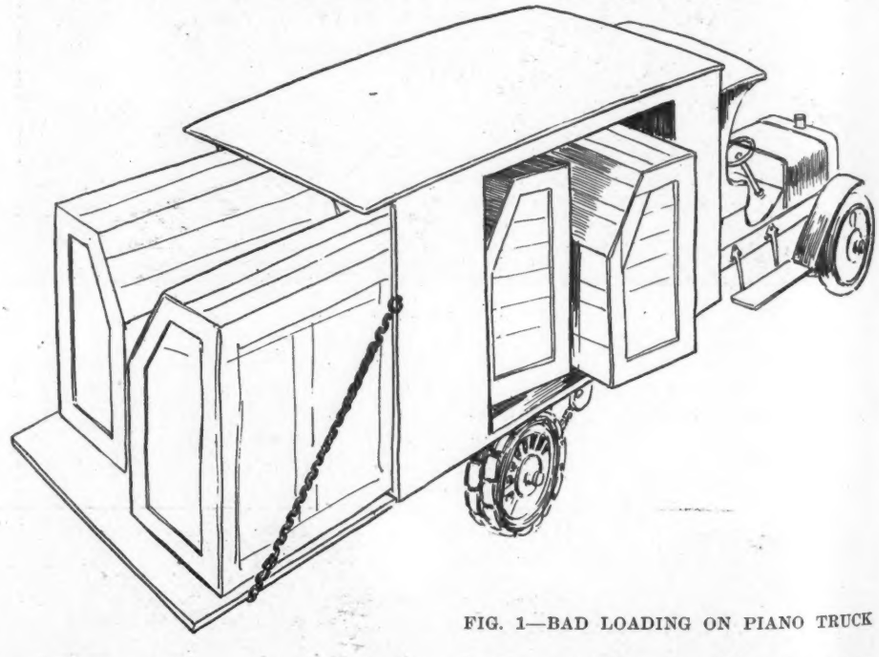


FIG. 1—BAD LOADING ON PIANO TRUCK

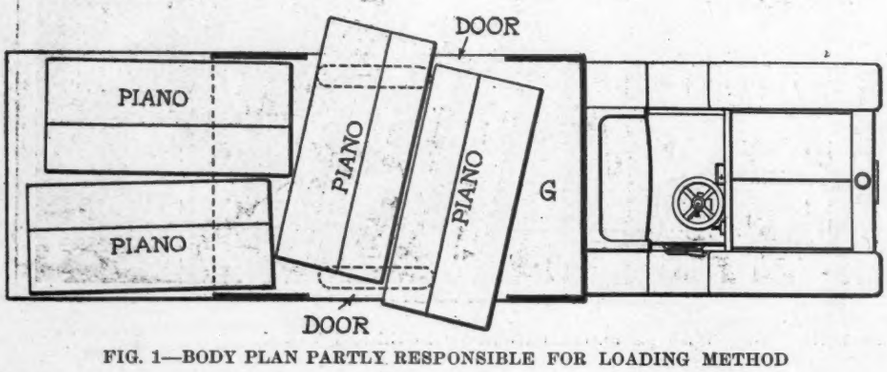


FIG. 1—BODY PLAN PARTLY RESPONSIBLE FOR LOADING METHOD

Tom stuck out his chest a bit and thinking to fool the foreman replied, "Oh, it's a new toolbox I just bought. What do you think of it?"

The foreman eyed the box in silence for a moment over his glasses then sniffed in reply. "Huh," said he contemptuously, "looks like some fool made it himself!"

Body Ill-Fitted to Job

That was just the way the body part of the converted touring car looked—"like someone to save money had built it himself." The workmanship on it was not bad and the finish fair but whoever made it was woefully ignorant of truck or delivery wagon body design. One needs only to say that two-thirds of the body stuck out back of the rear axle to give the reader an opinion of the looks of this delivery vehicle. A small boy would hesitate in catching a ride on the tailboard of this machine for fear his weight would teeter the front wheels off the ground by the leverage of the rear end. This car probably will not be long in delivery service for the firm now owning it, for even if the body does hold together, the tire expense will prohibit its working at a rational delivery cost.

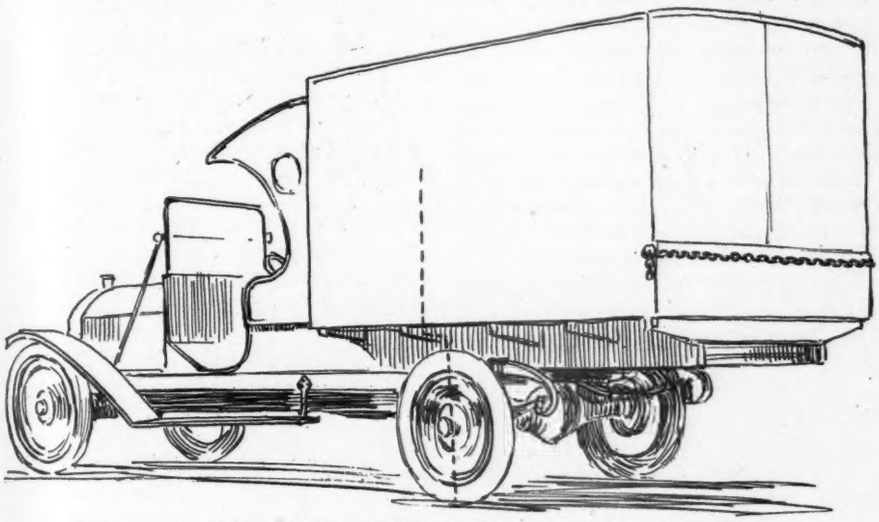


FIG. 3—TOO MUCH BODY OVERHANG ON CONVERTED TOURING CAR

Had Rear Axle Trouble

An iron and supply concern in using a standard make of truck was finally obliged to fit its truck with a new and heavier rear axle and tires on account of frequent overloads of long lengths of iron pipe. Often over half the length of a part load of iron pipes would be sticking out back behind the tailboard, throwing the weight clear to the rear. With this overload the rear tires wore out rapidly and finally the rear axle of the truck gave way. Newer and heavier equipment has done away with the trouble.

Had the body been designed so that the pipes could stick out forward the old axle and smaller tires would have performed the service with no trouble at all. The Monitor small truck has adopted a scheme allowing of this, and some such an arrangement might have been a more efficient remedy for the firm in question than fitting a new rear axle and thus deviating from the standard of the particular make of machine.

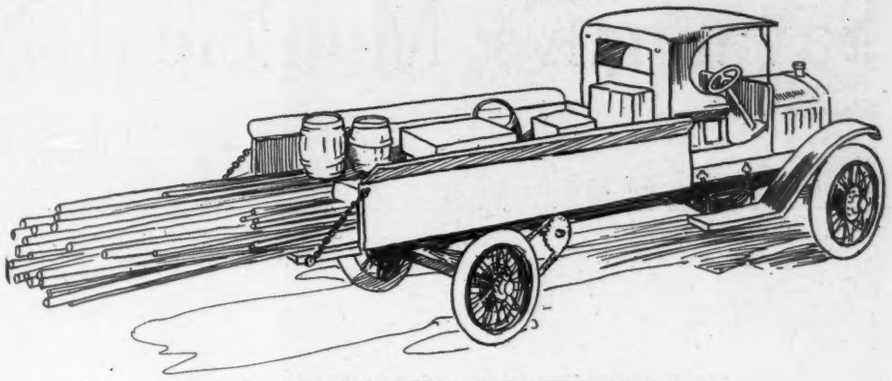


FIG. 2—CASE OF OVERLOADING WITH IRON PIPE

Burning up Tires

A direct injury to tires was noted in a ride on a meat truck from a storage warehouse to a downtown meat store in Chicago. The truck was of 2-ton capacity and was loaded with about 4,500 pounds of frozen meats. Leaving the storage plant and coming onto a cobble pavement, the wind blowing from the back brought a strong smell of burning rubber. Looking back from the seat the writer was just in time to see smoke stream out from under the car body like water from a street sprinkler, caused by the tires hitting the under side on bumps and rubbing at high tire speed. The driver paid no attention to it and the tire continued to smoke during a mile and a half run. This is a reflex result of overloading outside of the injury down to the same tires on the road at the same time. Rubber and heat are a poor mixture.

STRIKE BECAUSE OF MOTOR TRUCKS

Because modern motor trucks have been installed in part to replace team service by the Consolidated Bottling Co., of Chicago, thirty regular teamsters walked out today. The concern has added six motor trucks, each of which will do the work of two horse vehicles. The teamsters wanted each motor truck restricted to do the work of only one team. The company was compelled to seek police protection for its property, and threatened to shut out the striking ones unless they give up their foolish demand at once and return to work. On account of the teamsters' attitude, it has been necessary, according to George Lomax, president of the Consolidated company, to have three men on some of the trucks. In hiring chauffeurs to run the machines, the teamsters refuse to give up their wagons, and, upheld by the union, demand to ride on the motor trucks and to make the sales and give the receipts. In addition, a boy is taken along on the heavy routes to assist in the unloading.

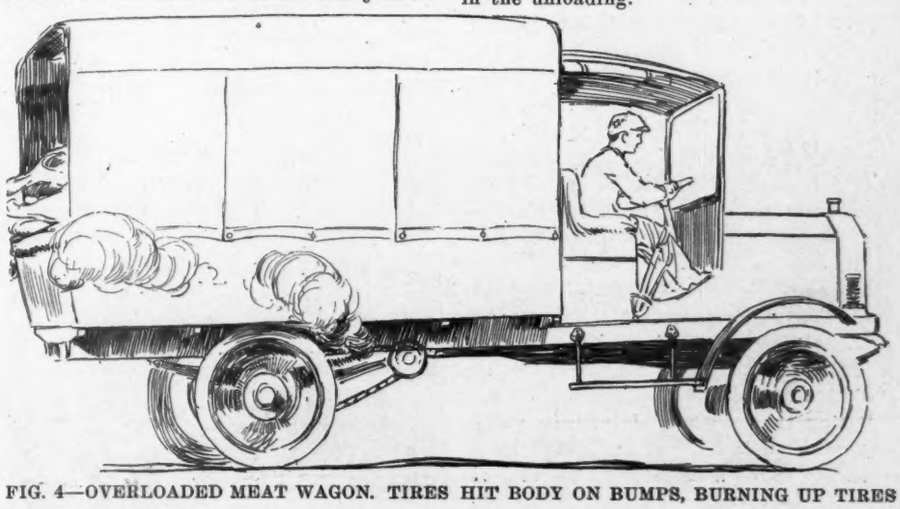


FIG. 4—OVERLOADED MEAT WAGON. TIRES HIT BODY ON BUMPS, BURNING UP TIRES

Savannah's Municipal Motor Service

COMPARATIVE statements issued by the officials of the Savannah fire department showing the cost of maintenance for 9 months of last year, with the horse-drawn apparatus, and for the same period this year, with the motor-driven machines, show a saving of $4,064.60 for the period. This decrease in the cost of maintaining the department has been effected despite the fact that there has been a decided increase in the cost of stock food, coal and gasoline.

The total cost of maintaining the department through September of last year, before the installation of the motor-driven apparatus, was $8,317.55. The total expense for the same month this year, while the motors have been in operation, was $4,064.95.

The figures for January show the expenses of the horse apparatus last year for that month to be $362.93, while for this year the expenses were $659.86. This shows a slight increase for the present year, but this is explained by the statement that there were certain extraordinary expenses during that month this year in connection with the few horses that have been retained for emergency purposes.

The statement for the month of February shows that during that month last year the expense of maintaining the apparatus was $1,804.75, including $825 spent for new stock, while for the same month this year the motor-driven machines were maintained, and the remaining horses in the department fed and kept in condition at a total expenditure of $308.03. The figures for that month show an advance in the price of oats of from 50 cents to 67 cents, and in hay from $1.30 to $1.65. There also was a slight advance in the price of coal, while there was a decrease of half a cent a gallon on the price of gasoline.

During the month of March it cost $379.40 less to maintain the department this year than it did last year. The total expense of the apparatus a year ago for that month was $1,033.13, while for this year it was $652.73.

The motor apparatus has proven economical in the figures comparing the months of April of the 2 years, despite the fact that there was an increase in the cost of feed. The price of gasoline, however, remained the same, although additional stock was purchased in this month of 1911. In April of 1911 the maintenance of apparatus cost the city $1,455.51, while for the same month this year it cost $463.80.

The expenses for the month of May this year show an increase of $135.69 over last year, but for the month of June a saving of $637.41 is shown by reason of the installation of the motor apparatus.

During the month of July, both years, feed was purchased, yet the comparative statement shows a decrease in the cost of

Comparison With Last Year Shows Considerable Saving

maintaining the department with the motors. The total expenses for that month last year were $968.16, while for this year it was $679.80.

The figures for the month of August show a decrease of $196.39 in the expense of maintenance, while for the month of September a decrease is shown as between $896.38 for the horse-drawn apparatus and $369.15 for the auto apparatus.

There was also a large coal bill with which the city was confronted regularly at intervals with the steam engines. This item has been practically eliminated, as the only coal now consumed by the department is in heating the buildings. The price of this commodity has also advanced considerably during the year.

In addition to this, Chairman Hull declares that unless the city had installed the motor-driven apparatus, the erection of another engine in the southern section of the city would have been necessary. This would have added considerably not only to the first expense of construction, but of equipping it with apparatus and maintaining it. Owing to the rapid growth of the city this would have been necessary, while with the fast motors the entire city is covered with fewer machines.

IMPROVING ODD MOMENTS

It is possible even with motor trucks to kill two birds with one stone. Revell & Co., furniture dealers of Chicago, have five motor trucks. These machines, through hindrances of delivery schedule, stand idle in loading for several hours during the day at the side and in the alley of the company's store. From 8 to 11 a. m. is not an unusual wait for these machines.

The loading is hindered by the fact that every piece of furniture put on must be brought from the store proper and not from the shipping room on account of its small capacity. This room would hardly hold goods to load one truck, much less five, and the machines wait accordingly.

While idle at the curb, however, waiting for the load in small bits at a time, the drivers are busy. On the morning of October 1 two of these machines were standing at the curb of Revell's store at 8:20 o'clock. One machine had two or three articles inside, the other was about one-fifth loaded. The one machine had the hood off and the driver with a helper was

busy soldering a leak in the radiator with the aid of an electric soldering outfit, the cord of which stretched across the sidewalk. He was making good use of his time while the truck was idle, doing work at this time to save delay at another. The presence of the electric soldering outfit at the store proved that the firm was with him in his work and furnished equipment for this sidewalk repair hour.

Under the second machine was the other driver, sitting on a piece of carpet and tinkering with the jackshaft and chain adjustments on the radius rods. Realizing that the idle time at the curb is unavoidable with present facilities, this firm is making double use of the delay by putting the drivers at repair work and adjustments while the loading is going on. The truck loading was being done by helpers.

PROPER LOADING OF TRUCKS

Proper loading is a big factor in prolonging the life of motor trucks, in the opinion of Harry S. Houpt, general sales manager of the American Locomotive Co. motor car department. How to secure the right distribution of a load, and the effect of good balance of weight in preserving the springs, tires and other features of mechanism, are told by Mr. Houpt in the following suggestions to motor truck drivers:

"Do not place all the heavy articles on the rear of the truck. If you place a heavy article on the rear of the truck, place an article of like weight on the front also.

"If you have a small and heavy load, such as steel rails, use a small body. Have the body constructed so that the load will be centered. If a tank body is used to haul over rough roads, it should be made only large enough to carry a normal load.

"Do not overload. If the body is too big, do not load the truck to the capacity of the body.

"Some drivers are unnecessarily hard on tires. The way the truck is loaded has a good deal to do with the wear. Balancing the load not only saves the tires and springs, but the driving mechanism also."

TRACTORS POPULAR IN CANADA

The Winnipeg correspondent of Canadian Agency Ltd. reports that during the present summer 6,500 motor tractors have been breaking new land for crop next year in the Canadian west. Putting their daily average at the extremely low figure of 10 acres a day, and allowing them 60 days' work during the season, which is a most conservative estimate, this would represent 3,900,000 acres of new land for 1913, and to this must be added the many thousand acres that have been broken by horses and oxen. No matter how rapidly transportation facilities are provided for the movement of the crop, the western farmer can keep ahead of them.

Cases Where Motor Trucks Save Money

THE Inspiration Consolidated Copper Co. of Miami, Ariz., has three Velie motor trucks in continuous service hauling supplies from the town of Miami to the Inspiration and Live Oak mines, distances of from 1 to 3 miles. One is of 1500-pound capacity, one of 1½-ton, and one 3-ton.

A record was kept for 1 month of the performance of the 3-ton truck in hauling fuel oil from the railroad station at Miami to Live Oak No. 2 mining shaft, a distance of 2.1 miles. The load consisted of 870 gallons of oil, weighing 6,740 pounds, which was over 3 tons in weight. The road was in fair condition, with less than 3 per cent grade for most of the distance, the last 200 to 400 yards having a grade of from 3 to 8 per cent. About 45 minutes was required for a trip loaded and 20 minutes for the return trip empty. The maximum number of loaded trips per day was six. The cost per ton-mile was 48 cents, of which 24 cents was for labor and depreciation, 13 cents for repairs, and 11 cents for fuel and oils. This was 9 cents per ton less than the cost of hauling by teams, a saving of 16 per cent.

This truck is now engaged exclusively in hauling oil to the two mines, while the two lighter trucks are hauling other supplies from Miami to the mines and between various points on the property. Besides the reduction in cost, the motor trucks effect an economy, by virtue of their greater speed and convenience, that cannot readily be measured in dollars and cents. The mine officials are satisfied with their performance and they have apparently come to stay.

THREE TRUCKS OUST SEVEN HORSES

John Luxem, wholesale meat dealer, Minneapolis, Minn., is using up-to-date delivery equipment in the form of two 1-ton Reliance trucks and one 1-ton Chase. The larger machines are used for city work in general, the smaller one for delivery nearer at hand. The machines have displaced seven horses and average 70 miles a day. About fifteen stops per trip are made the average length of stop being about 4 minutes. It takes about 20 minutes to load the vehicles. Tires last about 10 months. Each machine is doing the work of more than two teams, so that financially as well as from a service standpoint the machines are a success. The 2-ton machines have been in service 3 years, the 1-ton is in its first year.

SAVES $10,000 A YEAR

The Whitten-Gilmore Co., of Boston, Mass., handling Federal and Dayton trucks reports that a customer who does not wish his name published is saving $10,000 per year by the use of five 3-ton trucks. A daily expense per truck of $9.74 is averaged, including the wages of driver and helper. The five trucks are doing the work of twelve double teams costing $7 to maintain per day, with drivers and helpers. The saving is of course the difference in the outlay of $48.70 and $84 which equals $35.30 per day or $10,590 per year, allowing 300 working days. Drivers are paid $3 per day and helpers $2. Five drivers and five helpers do the same work that twelve teamsters and twelve wagon men do, the wage saving being $8,760 per annum, figuring teamster's wages at $2.50 and helpers $2.

Business Houses Relate Experience With Power Vehicles

QUICK COAL DELIVERY

William H. Harlow, Hyde Park, Mass., is an enthusiastic user of motor trucks in coal and lumber work.

"One day," says Mr. Harlow, "one 3-ton Kelly with the chauffeur and two helpers delivered to a consumer ½ mile from our scales 52 tons of coal in 6 hours 15 minutes. This coal was delivered in 100-pound canvas bags. Another 3-ton machine made ten trips with lumber averaging 1¼ miles from our yard from 7:30 a. m. to 6:00 p. m., carrying 32 tons. Each of our 3-ton machines is doing the work of two teams."

SERVICE IS SATISFACTORY

The Hoeffner Dry Cleaning Co., of Chicago, is a small concern in the north section of the city. For quick delivery work this firm has in use a Ford delivery wagon of well kept appearance which is doing much to establish the footing of this new concern in a new territory.

The machine operates over 30 to 40 miles of road every day, making thirty-five to fifty stops per day. The cost of running is less than $5 a day, all things included. The firm is enthusiastic over the machine and considers it an especially good investment as an advertisement outside of its delivery worth. The figures quoted were given offhand, as no accurate data is kept on the operation costs beyond gasoline and oil. The car makes about 20 miles to the gallon of gasoline. After the first enthusiasm of its use passes the firm probably will keep more accurate costs.

INVENTORS WORK ON SPLASH-GUARDS

Having asked for appliances to prevent the lateral splashing of mud by its city omnibuses, the Paris General Omnibus Co. has received about 200 inventions. The appliances are being studied by the omnibus engineers and the more promising ones will be asked to take part in a practical test at the expense of the bus company. Owing to the large amount of work involved in investigating the schemes, the date of the practical test has not been announced.

Independently of the bus company's competition, the Automobile Club of Seine and Oise is holding a splash-guard competition at Versailles on Saturday and Sunday, November 2 and 3. On the first day the ability of the appliances to withstand rough driving will be tested on a run from Versailles to Chartres and return, a distance of about 60 miles. As the road is straight and fast, high speed will be maintained. A total of 10 points can be obtained under this heading.

The second day of the competition the appliances will be tested over a mud track with white indicator boards on each side; also with a view to their longevity when brought in abrupt contact with the curbstone; and finally with a view to their quick attachment to either a fixed or an emergency wheel.

COST OF OPERATION

The W. H. Pipkorn Co., Milwaukee, Wis., is using one 5-ton truck, one 4-ton truck and one 1-ton truck in the delivery of fire clay products and building material. The cost of operating the 4 and 5-ton machines is given as follows:

	4-ton.	5-ton.
Gasoline	$18.50	$19.60
Mileage	771	808
Tonnage	498	580
Time, days	20	20
Average mileage	38½	40
Average tonnage	24.9	29
Miler per gallon gas.	4.17	4.12
Cost per ton.	$.60	$.50

The smaller capacity of the 4-ton truck, without any increase in daily mileage, accounts for its higher cost per ton.

CARRIES 90-FOOT TIMBER

The motor truck or motor vehicle has recently entered into another section of commercial life. The ordinary motor truck up to the present time has been unable to handle long-length timber, and it was one place where it could not supplant the horse.

The Knox-Martin tractor, however, has solved this question. The tractor of this make, owned by Pope & Talbot, of San Francisco, during the past week hauled two sawed timbers 20 by 20 inches and 90 feet long. The tractor took these two timbers all around the city, was able to turn the corners of any of the streets without backing and handled it so much easier than the horse-drawn vehicle that it not only surprised the lumber people but was also a revelation to the motor car men. Ordinarily, turning the corner with a horse, the leaders would have to go on the sidewalk to make the turn, but with the tractor it was able to go from one thoroughfare into another as easily as if it were a load of merchandise on the ordinary truck.

The Motorist's Kindergarten

EDITOR'S NOTE—Motor Age is publishing in this department a series of non-technical explanations of the various parts of motor cars for the benefit of the reader who knows nothing about them. The subjects will be dealt with in the most elementary manner, so that the series when completed will form a simple elucidation of the car.. The first article appeared October 10, 1912.

Relations of the Parts

LAST in the transmission line comes the rear axle. Rear axles are of two kinds. The most usual is the live axle employed in cars using either shaft drive or the single chain from the jackshaft. In those using the double chain, one to each wheel, the rear axle does not turn, and is therefore called dead or stationary. The live axle is so called from the fact that it turns, the rear wheels being bolted to it and the power from the motor is transmitted to the wheels through it. The two bevel gears mentioned above form the connection between the rear axle and the propeller shaft in shaft-driven cars.

The axle is covered by a casing or housing which is stationary, but on the inside, the live axle revolves with the wheels. You have noticed that in the middle of the axle housing of motor cars there is a bulge. This covers the bevel gears, but also covers another important part of the transmission system. This is the differential gear. To understand its use, imagine the car turning a corner. The outer wheels have farther to go than the inner wheels and must therefore revolve more rapidly. But, as has been explained, the rear wheels are bolted to the live part of the axle, and if the live axle shaft was solid from one wheel to the other one of the wheels would have to slide for they would both have to turn at the same speed. So the axle shaft is cut in two at the middle, each half turning with its wheel. But the power must be transmitted from the propeller shaft to the wheels through two halves of the live axle shaft. This is the purpose of the differential gear—to turn the two halves of the axle shaft for driving the rear wheels and, at the same time, to allow the wheels to turn at different speeds when the car is on a curve. The construction of this mechanism will be described in detail later; sufficient to say here that it consists of several small gears or pinions meshing with two larger gears on the ends of the two halves of the live axle.

In Fig. 3 is shown a view of a popular-priced four-cylinder chassis as it would appear if you sawed right through the middle of it from end to end. This view is what is called a sectional side elevation, and the arrangement and relations of the various parts of the power plant and transmission are very clearly shown.

Beginning at the front end of the chassis illustrated in Fig. 3 you will see a white I. This is the end of half of the front axle, and shows graphically why that shape of axle is called an I-beam axle. The two little white o's immediately behind the axle are the ends of the steering connections, which in this car are steel tubes. In some cars these are solid rods. On the axle is bolted the front spring, the front end of which is hinged to the front end of the frame and its rear end, which is hidden by the motor, is hinged to the frame farther back. The purpose of the radiator is self-evident; in order to keep the cylinders from getting too hot from the flame of the gasoline that is burned inside them, water is allowed to flow around them and this water is piped to the radiator. It flows through the radiator in small copper tubes from the top to the bottom and the air passing between these tubes carries away from the water the heat it has taken from around the cylinders. When the water gets down to the bottom of the radiator it flows back around the cylinders again. The radiator on a motor car works just the same way as it does in the hot-water or steam heating system in the house, except that its purpose is to cool the water instead of to heat the air. Behind the radiator is the fan. This pulls air through the radiator and works just the same as the small electric fan, except that instead of being run by an electric motor it is driven from the engine by a belt or gears or a chain. The pipe which conducts the heated water from the tops of the cylinders to the radiator can be seen in the illustration. It will be noticed that there is a pool of water all over the tops of the cylinders. This pool extends down around their sides and between them. The space in which this water flows around the cylinders of the motor is called the waterjacket.

The heavy white twisted line below the cylinders in the illustration is the crankshaft. As there are four cylinders to this motor, there is a crank on this shaft for each of them, although the two middle cranks are run together so that it looks as though there were only three. The light lines running up from the crankshaft into the cylinders are the connecting rods. The cross pin through their upper end holds them into the pistons. The front and rear ends of the crankshaft turn in the metal forming the base of the motor in journals called the main or crankshaft bearings. Some motors have one or more other crankshaft bearings between those on the ends.

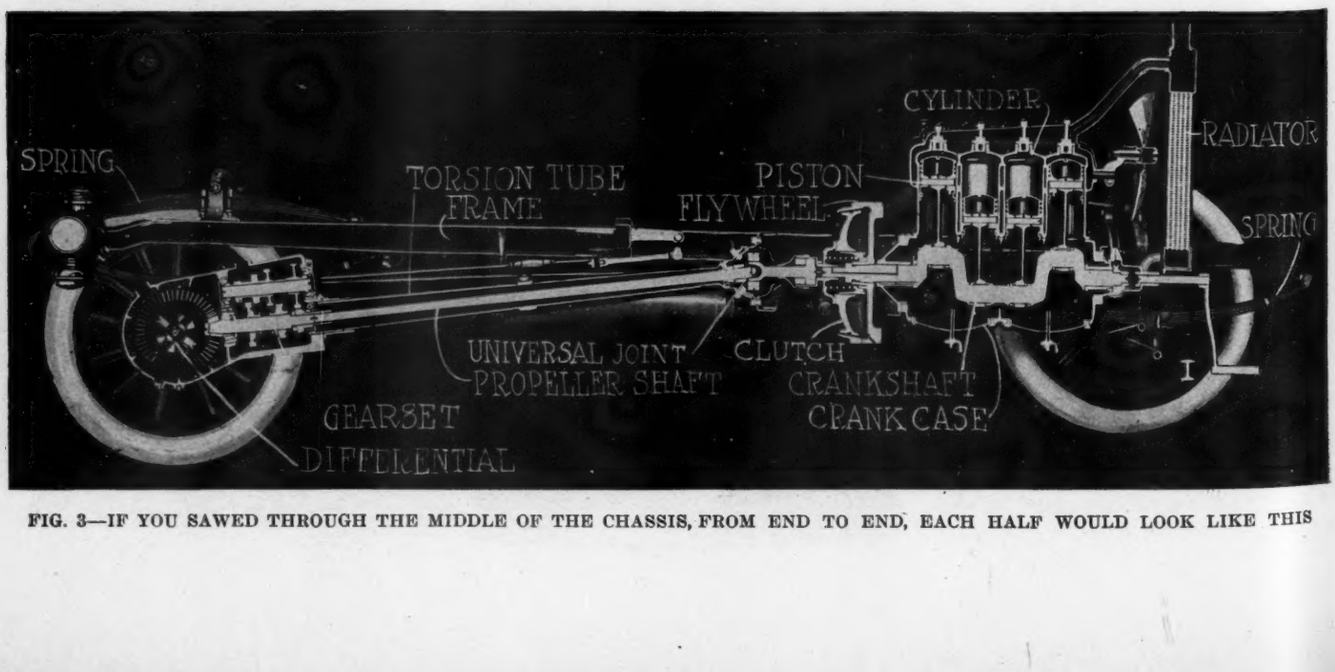


FIG. 3—IF YOU SAWED THROUGH THE MIDDLE OF THE CHASSIS, FROM END TO END, EACH HALF WOULD LOOK LIKE THIS

The irregular line below the crankshaft is the bottom of the crankcase. The crankcase is simply a pan that holds oil to lubricate the motor and this oil is kept at a level high enough to let the ends of the connecting rods dip into it. They splash the oil all around the inside of the crankcase and cylinders so that it finds its way to all places where it is needed.

Fastened to the rear end of the crankshaft is the flywheel. This is simply a cast-iron wheel which gets to spinning and keeps the crankshaft from stopping between explosions. It is heavy enough to keep turning for some little time after the explosions start it going around. In the case of the car illustrated in Fig. 3, the flywheel also contains the clutch. It will be seen that the rear edge of the flywheel tapers inwards toward the rear and on the inside of it is a smaller wheel whose rim has the same shape as the inside of the flywheel rim. This is the clutch. It is held back by a spring indicated by the double row of dots so that its face is pressing against the inner face of the flywheel rim. That is the position shown in the illustration, and it is pressing hard enough so that when the flywheel turns, the clutch turns too. The crankshaft ends there, the clutch not being attached to it but to the transmission shaft which runs back from the clutch. When the clutch is pressed inward its face does not touch the flywheel and so the flywheel can turn without making the clutch or the shafts behind it turn.

It will be seen that the short shaft to which the clutch is fastened runs back straight a little way to a ball-shaped affair, and there another shaft runs back at a slight angle. The ball-shaped affair is the universal joint by which the short shaft and the longer one are connected so that one can turn the other while not in the same straight line. The long shaft inclined downward is the propeller shaft and it runs right back to the gearset. Sticking out to the rear of the gearset is a short shaft with a small bevel gear on its end which meshes with a larger one on the rear axle. This car differs from the one illustrated in Fig. 1, October 10 as in this the gearset is on the rear axle, while the gearset of Fig. 1 was between the clutch and the propeller shaft, which is the more common practice.

A study of Fig. 3 will show that there is a tube running from the universal joint to the gearset and surrounding the propeller shaft. This is called the torsion tube or torque tube. It is attached to the frame at its front end and to the rear axle housing at its rear end. It forms the connecting link between the rear axle and the frame so that the rear axle pushes the car by pushing on this tube. Sometimes in place of the torsion tube, solid rods are used, which are called torsion or torque rods. Of course the rear springs are attached at their bottom to the rear axle and at their top to the frame, but they are not connected firmly enough to take all the strain of pushing the car.

The Motorists' Bookman

Text Book for Motor Car Engineering

TREATING the subject of motor car engineering in a general manner, and reviewing the development of the motor car in England, this work by A. Graham Clark in its first volume is on construction. Mr. Clark is a lecturer of some note on these subjects, and a member of the English Institution of Automobile Engineers. The book is especially valuable for its thorough descriptions of English motor cars which are the only ones treated in the book. In a deeper vein, the subjects of fuels; the thermodynamics of internal combustion engines; indicated horsepower, brake horsepower and formulated horsepower; mechanical, thermal and combustion efficiency; and crank effort are deeply entered into, and brief chapters are devoted to steam and electric cars. The book contains, including illustrations, double indexes, an exhaustive appendix of tables, charts and examination forms, 437 pages, bound in red cloth and selling for $2.12. Constable, London.

Carbureters and Engine Troubles

Containing fifty-four pages of readable and accurate information, the Breeze Carbureter Co., Newark, N. J., has published a book on motor car engine adjustments and care that, while in the form of an advertisement of its products, is valuable none the less. Coleman S. O'Laughlin is the author. This book, which is in pamphlet form, contains hints and instructions for the location and remedy of nearly a hundred troubles, frequently met with, and treats broadly troubles of all kinds, and very comprehensively those peculiar or related to carburetion. It sells for 50 cents.

In the Land of Sunshine

The motorist contemplating touring the Golden state will find John S. McGroarty's gracefully written history of that western commonwealth, entitled simply "California," excellent preparatory reading if he desires to get the most out of such a tour. With much detail, the history is given of its discovery only 50 years after Columbus found the continent of America, the establishment of the missions, life under Spanish and then under Mexican dominion, the brief period of less than 1 month as the Bear State republic, and its entry into the union. Published by the Grafton Publishing Co., Los Angeles.

More Route Books

Under the title of "Indian Pathfinder," or "Havoline Tours," a series of paper-covered tour books—fifteen in number—covering the entire country has been gotten out by the Indian Refining Co., New York City. Printed on manila paper of medium shade and weight, with cover of a heavier quality, each number is devoted only to a limited section which makes it of handy form and size. A brief digest of the laws governing motor cars for the territory covered by that leaflet is given in each, and, while the route information might have been a little more full without appreciably increasing the size of the book, it is well supplemented by maps.

British Patent Guide

As a guide to Americans after a patent in Great Britain, "Practice Before the Comptroller of Patents," by Carrol Romer, M. A., should prove of great value. The processes in England differ considerably from those in America, and forms are of great importance. This volume is the first of its kind, and is thoroughly up to date. It deals in detail with every feature of patent practice and precedent, in thorough-going English style. A complete appendix is included in the work, containing laws relative to patents, patent rules, fees, forms, and rules for appeals, together with various other regulations. Over 300 cases are cited, and many hints on proper precedent and method of procedure are given. The book contains 324 pages, is unillustrated, is bound in olive cloth, and is published by Street & Maxwell, Ltd., London, Eng.

Metallurgy Up-to-Date

A work on current practice in the production and manufacture of iron and steel has been prepared by Bradley Stoughton, Ph.B., B. S., and published by the Mc. Graw-Hill Book Co., of New York.

"The Metallurgy of Iron and Steel" is intended as a text book for colleges and for practical engineers, architects, etc. It is a complete and exhaustive treatise on American production and manufacture of the products of iron ore. Such a book supplies a well defined need for leading producers of steel and iron.

Inexpensive Motoring

"Motoring for Two from 10 Shillings a Week" is the title of a little brochure on motor car travel which must attract many, as it points out the feasibility of those of very modest means enjoying such journeyings as will not exceed 3,000 miles in a twelvemonth for the nominal cost for actual running expense of the car of $126.52. For such purpose various types of lightweight voiturettes and runabouts are suggested as possible, from those weighing 500 to 1,400 pounds, with a one or two-cylinder engine developing not less than 7 horsepower. The sociable, or three-wheeled car, is considered, as is also the possibilities of the motorcycle. The subject is made very attractive, and is written from the standpoint of one who has had experience, the author being Major C. G. Matson. Thomas Murby & Co., London, Eng. Price 12 cents.

Duesenberg Shares in Mason Honors

Unusual Motor with Splendid Record

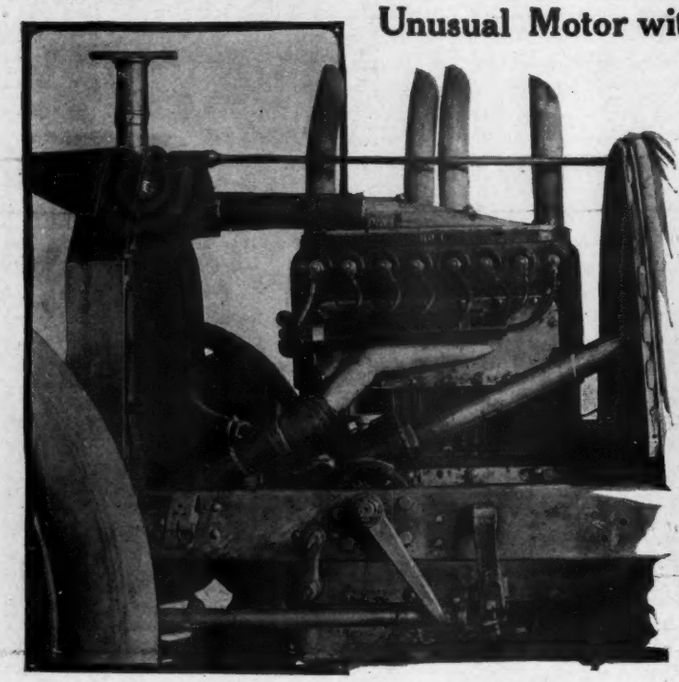


FIG. 1—LEFT SIDE OF THE DUESENBERG MOTOR AS FITTED TO THE MASON RACERS

Note the exhaust pipes which pass upward through the hood. Two sets of spark plugs are used, and pass horizontally into the cylinders

FIG. 2—RIGHT SIDE OF DUESENBERG MASON MOTOR AS USED IN PABST TROPHY WINNER

The valve mechanism is completely inclosed by the large cover plate, excluding all foreign matter and making simple appearing engine

IT IS becoming bromidic to make the statement that there is no better test of the stamina of cars and their motors than road races, for such contests have put more than one car on the map, to use the vernacular of the race fans. When a car can come without a break through the gruelling of sustained high speed maintained for hours over the type of roads comprising the most of the race courses, it is well-nigh all the evidence the public wants that it is a well-made car. That a car can hold an average speed of somewhere a mile a minute is sufficient proof of the nerve of the driver and the consistent performance of the motor.

Contests Bring Prominence

There is one motor that has leaped into prominence simply through its performance in the closing season's contests. This is the Duesenberg motor which pulled the Mason cars over the finish line as class winners in many of the important events of the year. Now that the 1912 racing season has come to a close, it is time to compare notes. The American cars which have competed in the big events of the year have acquitted themselves most creditably. They have all shown themselves to be mechanisms of stamina of which we well may be proud.

In the small-car races which have been held in conjunction with all the big racing meets this year, the Mason machines have excited much interest for their consistent performance. Early they began to get a name for themselves at the Algonquin meet, in which they were the runners-up for the Algonquin cup and won in their class. Later at Elgin they carried off the small car honors, while their most recent achievements have been the winning of the Pabst Blue Ribbon trophy and the Wisconsin trophy races, which were held in connection with the Vanderbilt and the grand prix events at Milwaukee. The

FEATURES OF DUESENBERG MOTOR

Intake and exhaust valves placed horizontally in cylinder head.
Valves operated by vertical walking beams whose lower ends bear on cams.
Valves open directly into explosion chamber—no valve pockets.
Three piston rings in one groove.
Intake manifold integral with cylinder casting.
Oil pumped through rocker arms.

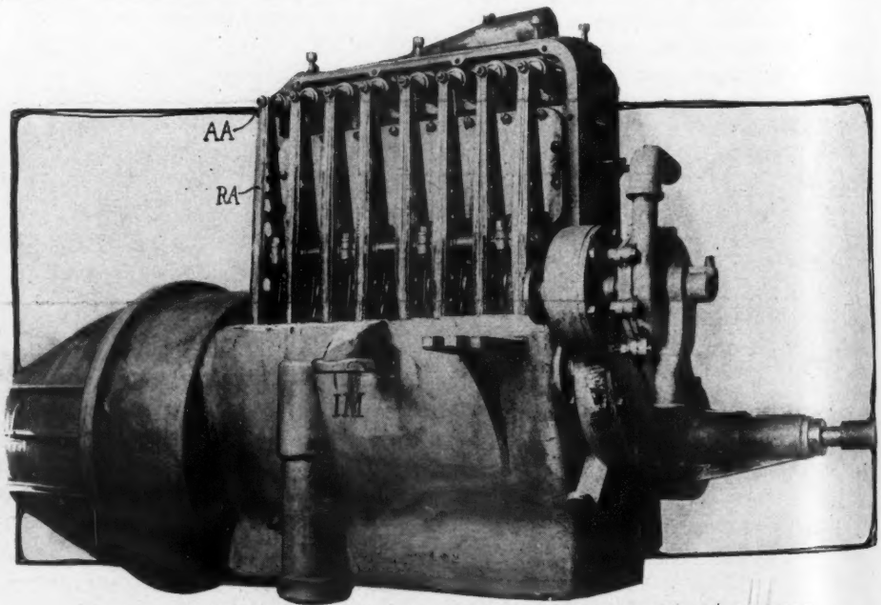


FIG. 3—VALVE OPERATING MECHANISM OF THE DUESENBERG MOTOR

Cover removed showing rocker arms R A in position. The lower ends of these arms bear on the cams while the upper ends are in contact with the valve stems. Adjustments A A provide for wear and are easily operated

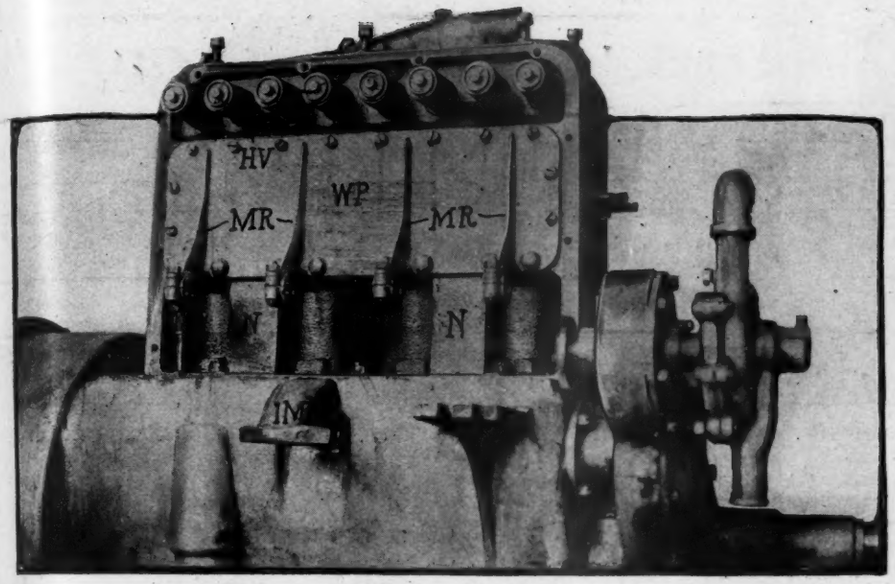


FIG. 4—SIDE VIEW OF DUESENBERG MOTOR USED IN MASON CARS

Note the horizontal valve stems and springs HV. The rocker arms have been removed, but the four bearings MR for the rocker shaft can be seen. These are integral with the detachable waterjacket cover plate W P

eyes of the racing world were centered upon that middle western city during the 4 days of the meet, and when the little Mason specials walked away with the small-car events, the motoring fraternity began to sit up and take notice. "What is there to these cars which causes them to perform so well?" was asked.

There are several things which help to make a good racing car, and one of these in undoubtedly the power plant or motor.

The motor used in the Mason specials which have come into the limelight of late is of most peculiar construction and is exclusively the design of F. S. Duesenberg and his brother, both of Marshalltown, Ia. The engine involves a number of principles for which patents have been applied. The most important are those which relate to the valve and rocker arm construction and to the method of oiling.

A number of views of the engine are shown herewith, as well as an illustration of the car in which Mortimer Roberts carried away the honors in the Pabst Blue Ribbon trophy race at Milwaukee. Perhaps the keynote of the success of this car and the others of the Mason team this year was struck by Mr. Duesenberg when he stated that the machines were not built for extreme speed, but rather for durability under extreme conditions.

Looking first at the two side views, Figs. 1 and 2, of the motor as it appears in Roberts' car, it will be noticed that the burnt gases exhaust through the top of the hood, the four vertical pipes carrying them outside the hood. Such a means of getting rid of the exhaust makes for least resistance to the outward flow. Fig. 2 shows the right side of the motor together with the magneto and water pump.

The appearance of extreme simplicity of construction is brought about through the use of the cover plate which completely incloses the valve mechanism, excluding all foreign matter and making possible the peculiar oiling of the valves and their parts, which is to be a patented feature.

Fig. 1, which is of the left side of the Duesenberg motor, shows how the two sets of spark plugs are arranged horizontally in the monobloc-cast cylinder heads. The large water connections are also brought out. Fig. 11 gives a front view of the Pabst trophy winner with the radiator removed. The location of the water pump at the front is seen, while the peculiar water connections also are to be noted.

Dimensions of Motor

The motor in the Mason special, entry No. 16 at Milwaukee, and driven by Roberts, has a bore of 3⅞ inches and the long stroke (as compared with bore) of 5 inches giving a ratio of 1.29. The valves, as already mentioned, are placed horizontally, opening directly into the explosion chambers, thus doing away with valve pockets. The inlet valves have a diameter of 1⅞ inch, while the exhausts are 1/16-inch less, and the lift of both is 11/32 inch. In placing the valves horizontally over the cylinder heads, the designers' idea was to not only reduce the wall area of the combustion chamber, but to put the valve exhaust openings in such a position that the burnt gases would have a very much freer exit than could be obtained by any other arrangement.

On the opposite side from the valves, plugs are placed, in the centers of which the spark plugs are located. These plugs or valve caps make it possible to inspect the cylinder heads and the piston faces and to remove carbon therefrom. The valves are of the conventional poppet variety, and they have a 30-degree bevel. The stems are 5 inches in length and 7/16 inch in diameter. The ordinary type of

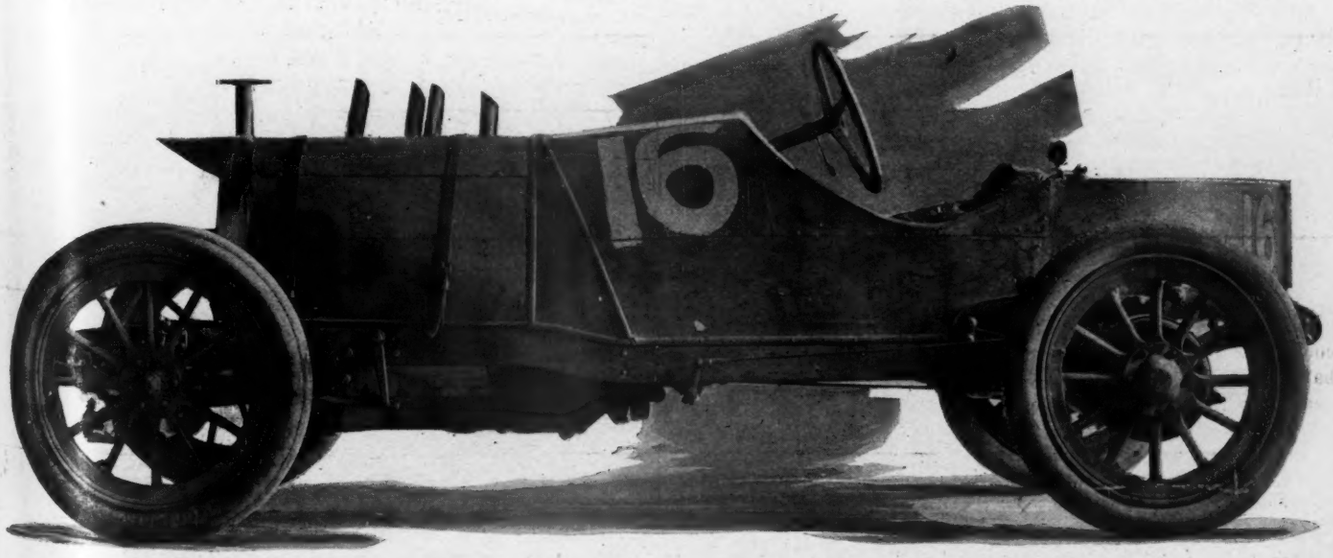


FIG. 5—THE MASON SPECIAL RACER WHICH WON THE PABST BLUE RIBBON TROPHY AT MILWAUKEE

The Mason cars have made an enviable record in their class, finishing in the money at Elgin, Algonquin and Milwaukee. The special racing cars are equipped with the Duesenberg motor described and illustrated on these pages. Note exhaust pipes extending vertically through hood

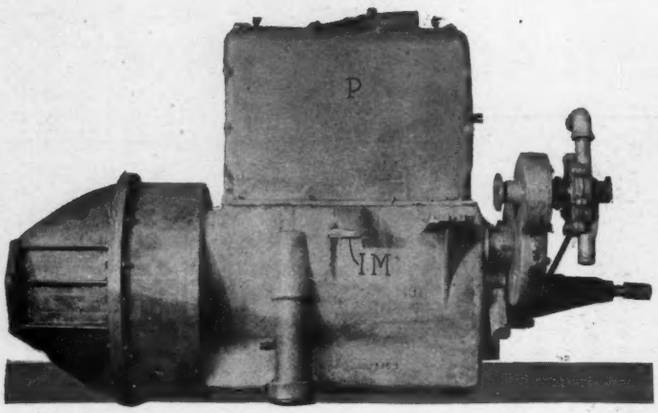


FIG. 6—RIGHT SIDE OF THE DUESENBERG MOTOR, SHOWING COMPACT APPEARANCE

Valve stems, springs, rocker arms, etc., are enclosed by a single Plate P. Note the inlet manifold connection I M which is a part of the crankcase. The gas is led up to the valve pockets through two passages which are an integral part of the cylinder casting

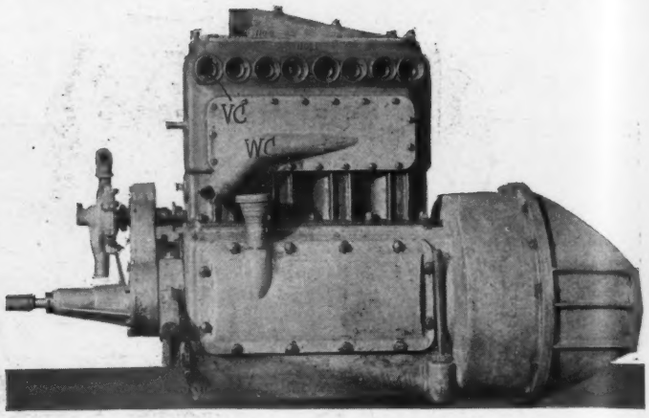


FIG. 7—LEFT SIDE OF MOTOR, SHOWING OPENINGS IN SIDE OF CYLINDER HEADS

Through these openings VC, the valves which seat on the opposite side, may be reached. Note the large water connection WC, which has the appearance of an exhaust. The spark plugs are fitted horizontally into the valve caps VC

coil spring serves to close the valves. Opening is accomplished through the use of long rocker arms, shown in Fig. 3 at RA. The lower ends of these rockers rest against the cams, which are an integral part of the camshaft.

The upper ends of these rockers are in contact with the ends of the valve stems, as shown. These ends are provided with adjustments AA which allow for the taking up of any wear, and for fixing the clearance between stems and arms. The contact points of the rocker arms are hardened. These arms have a length of 14 inches. The distance from the point of cam contact to the center of the arm pivot is 6 inches, while from the rocker shaft to the valves is 8 inches. This greater length above the rocker shaft gives quicker cam than valve action, making for quiet cams.

Rocker Shaft Bearings

It will be seen that the rocker shaft is provided with four bearings, one between each pair of rockers. These bearings are integral with the water jacket plate, as shown in Fig. 4, which is a view of the motor with the rocker arms removed. The bearings are seen at MR, while the water jacket plate is indicated by WP.

It perhaps already has been noted that the cylinder casting is of the monoblock type, while the crankcase is also in one piece. In the conventional type of motor there are two halves to the latter. The crankshaft, however, is easily reached through the large opening shown in Fig. 7. The crankshaft has two bearings, while the camshaft is provided with three. An idea of the overall dimensions of the motor may be gained from the monoblock cylinder casting dimensions. The length of this casting is 18½ inches, the height 14 inches, and the width 6 inches, it being faced on top, both sides and the bottom, the latter where it joins to the crankcase, and the other three facings to receive the water jacket plates. The various engine dimensions follow:

Crankshaft bearings—
Front—1⅞ inch diameter; 4 inches length.
Rear—1⅞ inch diameter; 4½ inches length.
Camshaft bearings—

FIG. 8—VIEW OF MASON RADIATOR

Showing scoop on top of radiator to direct the air on to the tubes

Front—1⅛ inch diameter; 4 inches length.
Center and rear—1⅛ inch diameter; 2 inches length.
Connecting rod, lower bearings—2 inches diameter; 2¼ inches length.
Wrist pin bearings—1⅛ inch diameter; 2⅝ inches length.
Jacket space—⅜ inch thick.
Cylinder, and jacket walls—¼ to $\frac{5}{16}$ inch thick.
Connecting rod length, center to center—10$\frac{3}{16}$ inches.
Length of pistons—4¾ inches.
Piston rings—three of bull-ring type—Under ring ⅝ inch wide; outer rings $\frac{5}{16}$ inch wide.
Flywheel—15¼ inches diameter; weight, 60 pounds.
Crankcase opening—5½ by 16 inches.
Horsepower—58 at 2300 revolutions per minute.

Three Rings in Slot

An idea of the peculiar piston construction may be gained from Figs. 12 and 13. There are three rings which are placed in one groove. One of these is twice as wide as the other two, and is placed underneath the two smaller ones. The ring joints are of the bevel type. While the pistons have a length of 4½ inches, only 3¼ inches of this length is in contact with the cylinder walls, the pistons being less in diameter for 1½ inches of their length, as seen in the illustrations. This is done to decrease the wear, and to aid in the oil distribution.

Another peculiar feature of the Duesenberg motor is method of conveying the explosive mixture to the intake valves. Looking at the views which show the

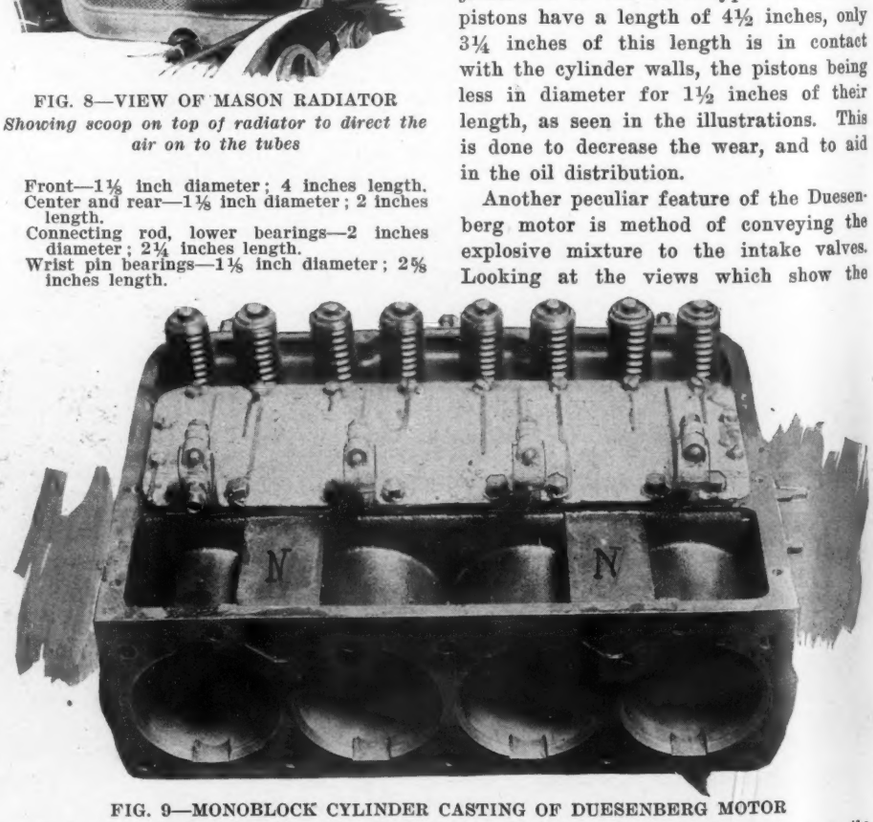


FIG. 9—MONOBLOCK CYLINDER CASTING OF DUESENBERG MOTOR

Showing the integral passages N through which the gas is led up to the valves from the intake manifold cast in the crankcase

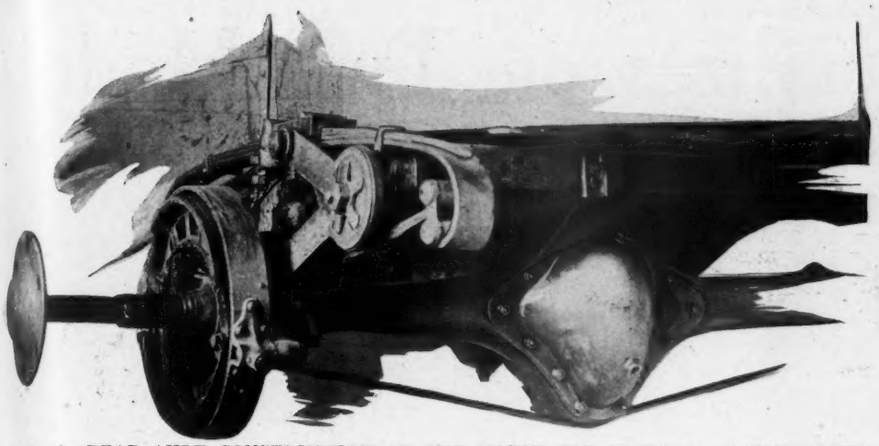


FIG. 10—REAR AXLE CONSTRUCTION OF THE MASON CAR, WINNER AT MILWAUKEE

One wheel has been removed, while the flange to which the wheel bolts, is shown. This flange, which is integral with the axle shaft, has no part in holding the wheel on, but simply acts to turn the wheel. The latter is held on by nuts which screw into the rear axle housing

valve side of the motor, the inlet IM, Fig. 12, which is integral with the crankcase, will be noticed. The inlet passages are cast as a part of the crankcase and pass from them into other passages cast integrally with the cylinder casting. Part of the cylinder passages will be seen at N, Fig. 4 and Fig. 9. After entering the crankcase at IM, the gas is split up into two parts, passing upward to the intakes, one integral passage going to each two cylinders. The crankcase openings from this part of the motor into the cylinder passages are seen at N, Fig. 4. Thus the gas passes back of the rocker arms and up to the valves.

Lubrication of Motor

The oiling of the motor is interesting. The main crankshaft bearings, connecting rod bearings, and cylinders are provided with lubricant by splash from the dipping of the ends of the connecting rods into the oil troughs, in the conventional way. There is a trough for each rod end. The oil runs down into the base of the motor which has a capacity of 2 gallons. From this point it is pumped up into the hollow rocker arm shaft and to the four rocker arm shaft bearings and the bronze-bushed rocker arm bearings. From the latter, the oil is sent to the cams through oil leads which pass down the rocker arms from their bearings. From the cams the lubricant flows again to the oil troughs under the connecting rod ends, and its cycle is complete. The four troughs are provided

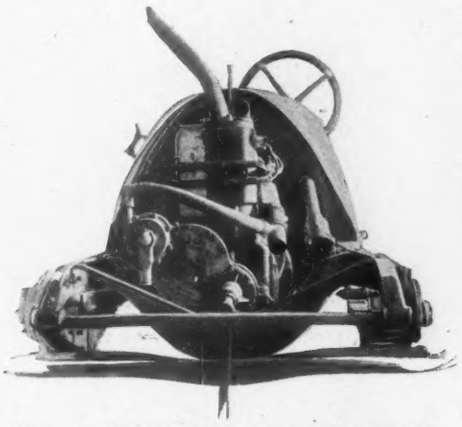


FIG. 11—FRONT VIEW OF MASON RACER

The water pump is seen with its connections. Water circulation is a combination of positive pump and thermosyphon methods

with outlets or regulating tubes which govern the level oil in the troughs. The regulating tubes are so arranged with slots that by raising or lowering them, the level of the oil may be varied from ¼ inch to 1¼ inches. For racing purposes, the level is regulated for 1 inch.

But the feature of the oiling scheme on which the patent is asked is the lubrication of the valve stems. The aluminum plate which completely incloses valve stems, rocker arms, and so on, is oil tight, and when the motor is running at considerable speed, the splashing of the connecting rod ends into the troughs sends a mist of oil up through the slots in the top of the crankcase through which the rocker arms pass, and on up to the valve stems, thoroughly lubricating them. The idea of this scheme is that wearing of the valve guides is prevented, giving the stems perfect contact with the guides. This lubrication of the stems also serves to keep the exhaust valve stems cool, preventing them from becoming blue black for more than ¼ inch into the valve guide.

The water jackets are deserving of mention, as the cylinder casting is open on both sides and on the top. The left side open space is covered by the aluminum plate of which the inlet water connection WC, Fig. 7, is a part. The plate on the right side carries the four supports for the rocker arm shaft. The top jacket opening is covered by the plate which also forms the water outlet manifold.

Mason Running Gear

Passing from the power plant to the transmission system and running gear of the Mason special, we find that the gearset, which has three forward speeds and reverse, is mounted at the rear axle. The gearset is contained in a special case which is bolted to the axle housing. The gear ratio is 2⅝. The differential carriers are a part of this case. Special axle shafts are used, the flanges which bolt to the rear wheels being integral with these shafts, as shown in Fig. 10. The axle-shaft flanges have nothing to do with the holding of the wheels in place.

The drive shaft is inclosed within a torque tube, the rear end of which bolts to the forward end of the transmission gearset case. Two radius rods run from the front end of the torque tube to the axle housing, in the conventional way.

The front axle is of I-beam type, having a 3½-inch drop at its center. Front springs are half-elliptic; rear, elliptic. The car carries 32 by 3½-inch tires. Its wheelbase is 104 inches and its weight about 2,000 pounds.

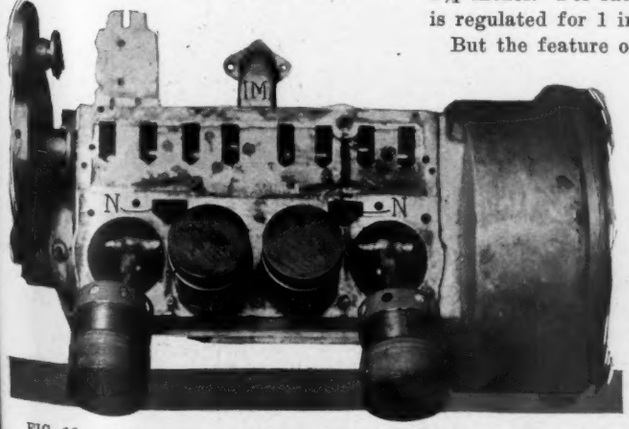


FIG. 12—TOP VIEW OF DUESENBERG MOTOR CRANKCASE

This shows the piston construction and the slots for the valve rocker arms. N indicates the intake passages and IM the intake manifold cast on the crankcase

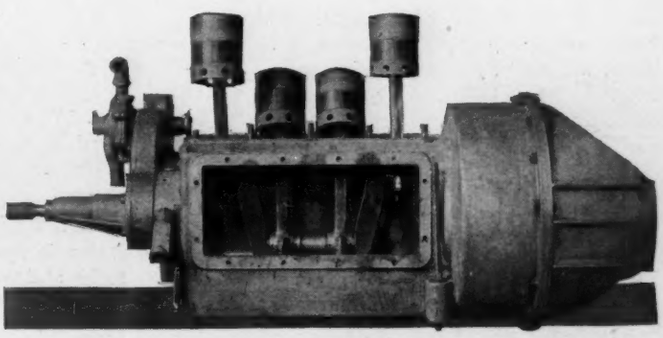
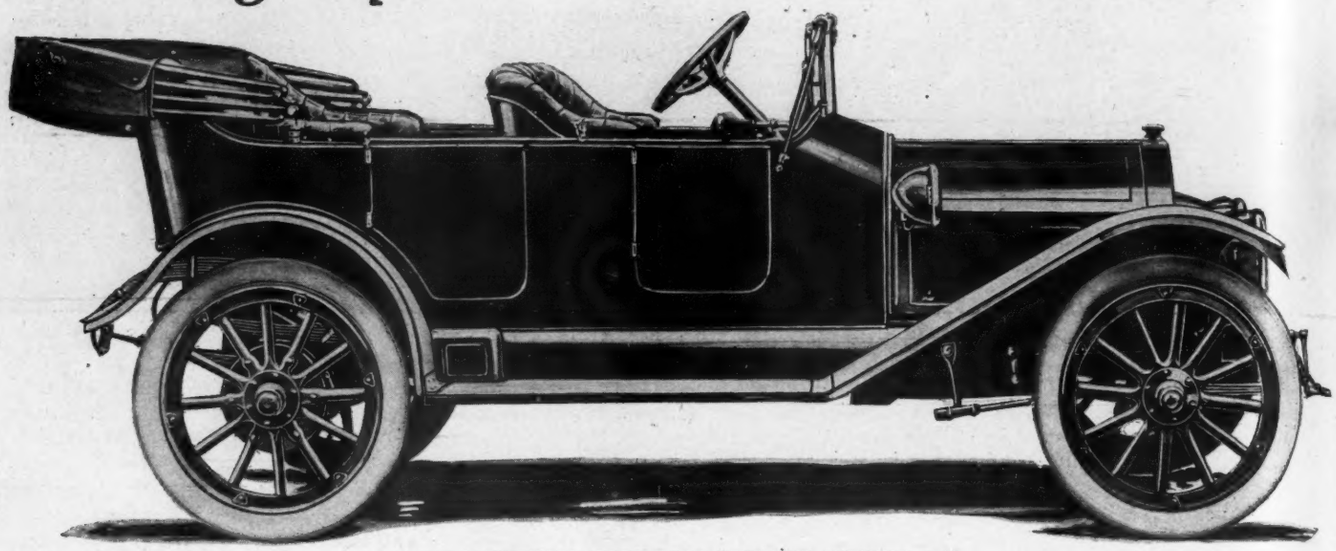


FIG. 13—LEFT SIDE OF MOTOR WITH CYLINDERS REMOVED

A large crankcase opening is provided, making the crankshaft and bearings readily accessible without taking down the motor. Piston rings are placed in a single groove

Cutting Specializes on Two Models



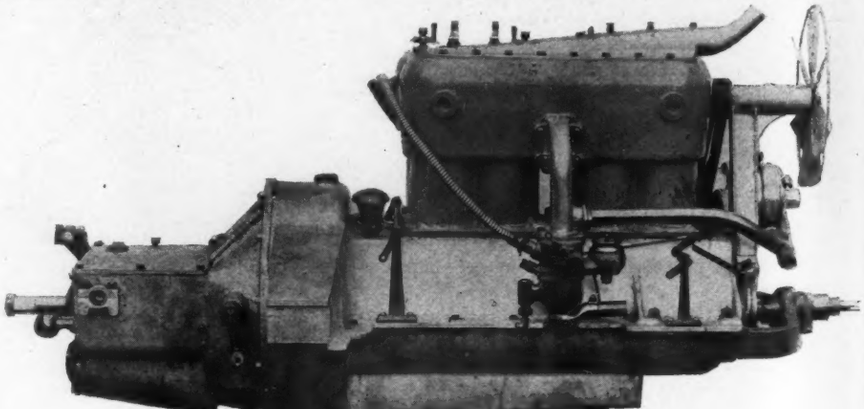
FIVE PASSENGER FORE-DOOR BODY ON CUTTING A-40

IN the announcement of the new line of Cutting cars for the 1913 season is indicated a change in policy of the makers which will make for increased production in the future. Instead of the six different models produced for 1912, the energies of the plant will be confined to but two body styles, both of which are fitted to the same chassis. The two cars to be manufactured next year are a two-passenger roadster and a five passenger touring car, fitted on a single chassis type called the model A-40.

Although the basic principles of Cutting construction heretofore adhered to remain the same, important changes along the lines of improvement and refinement have been made, of which the adoption of a unit power plant with three point suspension stands in the foreground. Other prominent features are increased wheelbase, demountable rims and 36-inch wheels on all models, and electric side and tail lamps with gas headlights, roomy, metal bodies, and self-starter. A feature that the maker emphasizes is the fact that every hole drilled through metal is hand reamed.

The roadster and touring car will be built on one chassis with interchangeable bodies and steering gear. The three vital parts, the motor, the clutch and the transmission are combined as a single unit, encased and suspended on a three-point support, making it impossible for these parts to get out of alignment. The two rear supporting arms on the motor reach to the main side bars, and the third point is suspended on the center of the front crossbar by a steel casting reaching from both sides of the crankcase, thus doing away with the subframe used heretofore. There is a large bearing on the third point of suspension which allows the motor to swivel from torsional strain on the frame.

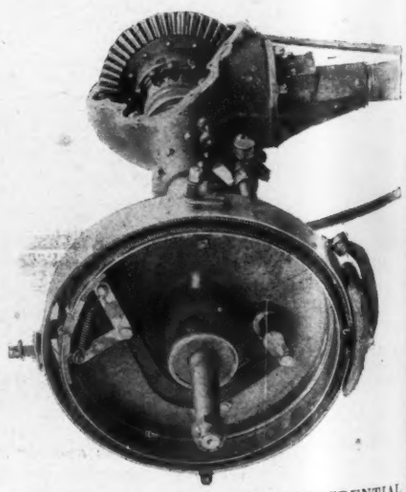
The 1913 product will be fitted with a four-cylinder, vertical, water-cooled engine, cast en bloc. The bore of the cylinders is 4 inches and the stroke is 5 inches. The crankshaft is 1¾ inch in diameter, the rear main bearing 4 inches long, the center and front bearing 2¾ inches. The four cylinders are cast with integral water-jackets and the valves are placed on the left side, fully enclosed with cover plates. The pistons are fitted with four ¾ inch compression rings and are 6 inches long. The valves are 2½ inches in diameter, the port 2⅝ inches, heads nickel-steel electrically welded to carbon-steel stems. The camshaft is $\frac{15}{16}$ inch in diameter, while the drop-forged connecting rods follow the usual construction and are 12 inches long.



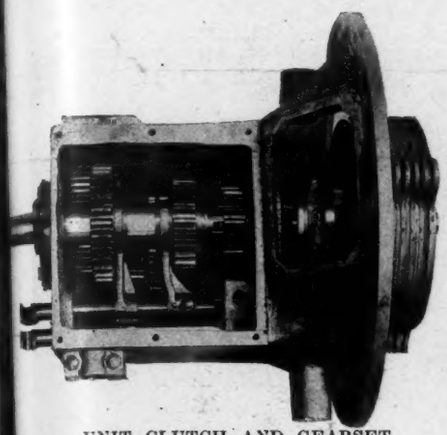
INTAKE SIDE OF MOTOR OF MODELS A AND B

How Cutting Motors are Lubricated

Lubrication is by means of a very efficient self-contained force feed system, oil being forced through hollow crankshaft directly to the main and connecting rod bearings. Oil is pumped by means of a gear pump located on the outside of the lower crankcase and driven by spiral gears from the camshaft. It is forced to a main duct cast integral with the crankcase and from these distributed by means of ducts cast in the web, to the main bearings. From here it is forced through a hollow crankshaft to the connecting rod bearings, and thus a constant stream of oil is forced over each bearing when the motor



CUTTING BRAKES AND DIFFERENTIAL



UNIT CLUTCH AND GEARSET

is started. The circulation of the oil through the crank arms and connecting rod bearings is in the direction of the centrifugal force, instead of opposite, as is the case in splash lubricated motors, where the oil must be carried from the outside of the bearing inward. A fine wire gauze is brazed to the opening of the oil pump to prevent grit or sand getting into the bearings. A sufficient amount of oil is thrown off by the connecting rods to thoroughly oil the pistons and cam shaft, both of which are provided with oil pockets. An oil gauge extending to the level of the crank case and located on the exhaust side of the engine, indicates, by means of a float and ball, the exact amount of oil contained in the reservoir. Distinct marks on the glass gauge show the high and low mark, and if the oil is maintained between these two levels, no burnt oil is emitted, nor is there any danger of cutting the bearings.

As previously stated, all motors are water-cooled, the circulation being through centrifugal pump. The radiator is of the square tube design. The fan is ball bearing, and provision is made for taking up any slack in belt. The multiple-disc clutch differs from that used this year, in that it runs in a bath of oil circulating from the gearset and more plates are employed. This year's clutch had but seven plates against fifteen plates next year. The gearset is a three-speed selective sliding gear type, with annular ball-bearings throughout. All gears are of carbon steel, specially heat treated. The gearset is held securely to the flywheel housing by means of twelve ⅜-inch cap screws.

Inside control is employed. The gearshift lever is pivoted both on the gearset and main side bar, making it impossible to bind in shifting from one gear to another. The emergency brake is hung on the same line with the gearshift control but traveling on a different shaft, making it impossible to bind the shifting device when the emergency brake is applied.

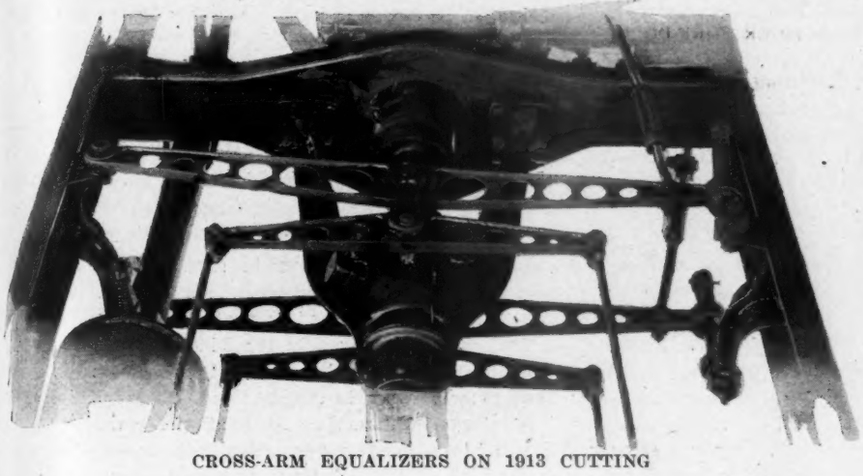
The propeller shaft and universal joint are anchored to the middle cross-member in alignment with the universal joint. The middle cross-member is removable, being belted instead of riveted to the main side bars. By dropping the propeller shaft and removing the cross member to the rear 4 inches, the gearset can be taken out of the frame. The propeller shaft yoke is carried on two brackets anchored to the cross-member, and has two large steel bushings cotter-keyed to the bracket. By keying the bushings to the bracket, and using bronze bushings in the yoke, it places all the wear on the bronze bushings, which can be replaced very cheaply.

The bar evener equalizing brake system is used, both the emergency and foot brake having separate and distinct equalizers of their own to insure perfect equalization of the brake power. Front axles are I-beam section, single drop forgings with spring seats and steering yoke integral. Rear axles are of the semi-floating type. Frames are pressed steel and heat-treated, reinforced by cross members, and are heavier than those used in 1912.

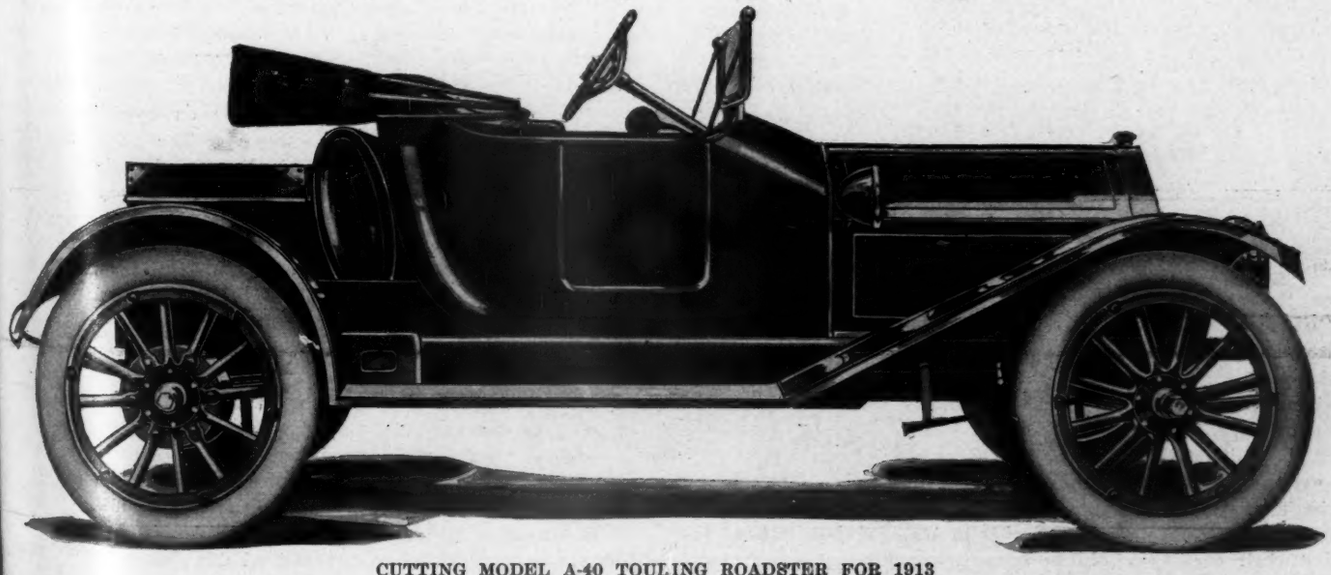
Thirty-six-inch wheels of the artillery type with demountable rims are used. The spokes, twelve in number for each wheel, are 1¾ inches in size.

The worm-and-gear type of steering system is used. The steering wheels are of black walnut, notched grip, 18 inches in diameter. The spark and throttle levers are placed on a sector above the steering wheel, with foot accelerator on the floor board.

All cars will be trimmed in nickel and black throughout and sold with full equipment, including self starter, top, top boot, windshield, tire holder, one extra rim, Presto-Lite tank and dash head-lighter, robe rail, foot rail, tool kit, pump, and tire repair outfit.



CROSS-ARM EQUALIZERS ON 1913 CUTTING



CUTTING MODEL A-40 TOULING ROADSTER FOR 1913

From the Four Winds

BENZ DOING 101.5 MILES PER HOUR IN GAILLON HILL-CLIMB, AND ITS DRIVER, FRITZ ERLE

NO such speed ever was shown in a hill-climb as was displayed by the 200-horsepower Benz which Fritz Erle drove in the French Gaillon event in which he averaged 101.5 miles per hour. The climb was made from a flying start over an absolutely straight course, having an average gradient of 8.8 per cent, the maximum being about half way up and the last few yards easing off. The timed portion of the hill is 1 kilometer in length, which was covered by the Benz in :22 flat. The car which turned the speed trick is one of a series of fast touring models, which are guaranteed to show 125 miles an hour on the level. The motor is a four-cylinder of 7.8-inch bore and 9.8-inch stroke, the cylinders being cast in pairs and having the two valves mounted vertically in the head, with the operation by rocker arms from a single camshaft on the right-hand side. The racing motor has two distinct magnetos, firing two plugs per cylinder simultaneously

CAREFUL of the Sick—The Automobile Club of Syracuse, N. Y., is planning to have made a number of signs reading, "Sickness in this block. Please make no unnecessary noises."

Stopping Throwing of Glass—The Louisville Automobile Club has paid a total of twenty rewards this summer to persons who assisted in the conviction of offenders who threw glass into the streets.

Louisville Meet Postponed—Because of a dangerous track, the races which had been scheduled for October 20 at Churchill Downs, Louisville, have been postponed 1 week. They will be held Sunday afternoon, October 27. Nine events have been announced, including a motor cycle race. The Case team will participate.

Would Impound Car Also—An ordinance is being prepared by Councilman Bonhert, of Columbus, O., which provides that on charges of violating the speed law the car be locked up for a certain length of time, as well as the chauffeur. Mr. Bohnert is of the opinion that locking the car up for a few hours or days in extreme cases will solve the problem of speeding. City Solicitor Bolin has been asked as to his opinion on the constitutionality of the proposed ordinance.

Balk at Using Taximeters—A proposal on the part of taxicab owners of New Orleans to equip their cars with taximeters has met with decided opposition on the part of the chauffeurs. No reason is given for the stand taken, but it is thought an attempt to install the devices would result in a strike. Complaints of overcharges and other abuses on the part of the taxicab driver have been increasing and the owners are anxious further to protect their customers and to decrease the possibility of being victimized themselves. The question being debated at present is whether the advantages to be gained will justify the losses certain to accompany a strike.

New Delaware Officials—The Delaware Automobile Association at its annual meeting elected the following officers for a year: President, T. Allen Hilles; first vice-president, Joseph Bancroft; second vice-president, A. B. Richardson; third vice-president, A. Greenbaum; secretary, Charles G. Guyer; treasurer, William Staniar; executive committee, John B. Bird, Walter L. Butler and John J. Satterthwaite. It was announced that the club will do its share toward having signposts erected on the direct routes between New York and Washington.

New Route to Mountains—Several petitions have been prepared in Boston asking that Governor Robert P. Bass and his council of New Hampshire take steps at once to establish a new route to Bretton Woods, at the apex of the White mountains, the road to go by way of Boston, Fellsway, Stoneham, Reading, Andover, Lawrence and Methuen, these places being on one of the Massachusetts through routes, and then connect in New Hampshire with Salem, Derry, Manchester, Suncook valley and Concord, from the latter place joining the regular state highway. This new route would make a saving of about 25 miles over the present route through Lowell, Mass., and Nashua, N. H. The roads over the proposed new route in New Hampshire are not very good, but they can be put in shape without a great deal of expense, so if action is taken now something may be done next spring. If action is taken there will be a number of motor races staged at Rockingham park next year. It would also be of benefit to the mountain hotel trade, for it would bring the places nearer Boston and more motorists would take short trips when a saving of 50 miles could be made.

Association in Maine—The Somerset, Me., Automobile Association, the first one formed in that county, has just been organized in the Pine Tree state, making its headquarters at Skowhegan. It will work in conjunction with the Maine State Automobile Association for the benefit of good roads. The officers elected were W. P. Ordway, president; Roy L. Marston, vice-president; John E. Taylor, secretary, and Leslie Goldsmith, treasurer. Maurice Merrill is counsel. The membership fee is $2 for motor car owners.

Checking Reckless Driving—Members of the Asheville Motor Club, of Asheville, N. C., have formulated a plan whereby they hope to stop speeding, reckless driving and other practices of a few reckless owners of cars in this city, whose lawless driving, so members of the club assert, is bringing ill repute on every motor car owner in Asheville. The plan adopted by the club is to have cards printed as follows: "I wish to report car No. ——, driven by ———— on street ———— at —— o'clock. The car was driven lawlessly in the following manner." These cards are to be given to twenty of the more conservative members of the club, and every time they observe a car being driven in a manner violating any of the city ordinances a card will be filled out and mailed to the secretary of the club. The receipt of the first card by the secretary will cause the culprit to receive a friendly warning from the club. The second offense will bring him a notice that he has received his last warning, and

when the secretary receives the third card on the same man the matter will be turned over to the chief of police and all the members who noticed his infraction of the law will appear against him in court.

To Talk on Highways—The Taunton Automobile Club is now trying to arrange a date to get Logan Waller Page, the government expert of highways to visit Taunton, Mass., and make an address there on road maintenance, the club planning to have the talk in a large hall where everyone may attend, whether a member of the club, a motorist or not.

Speedway Staff Completed—With the appointment of H. C. Bradfield as chairman of the press committee, the working organization of the Indianapolis speedway for the next big contest, May 30-31, has been made complete. Homer McKee, who will have supervision over the general publicity plans; Theodore Myers is in charge of the financial and clerical work, and Captain W. P. Carpenter, Indiana National Guard, in charge of public safety.

Penn Improves Roads—Since the Pennsylvania state highway department took over 8,000 miles of highways in the state June 1 the department has improved 4,700 miles of roads. This total includes those that have been rebuilt under the seventy-nine contracts so far let under the Sproul act and those that have been repaired by the road superintendents, forty-seven of which have been named out of fifty the law calls for. The water breaks have been removed from the improved roads and much side-ditching for drainage purposes and underdraining has been done.

Penn Prepares Tags—The first issue of Pennsylvania license tags for 1913 will be made by the motor car division of the state highway department in December, almost 2 weeks ahead of the time of issue in the past, and it is expected to break all records for the first issue. The licenses will be sent out as rapidly as possible, owing to the fact that on January 1, 1913, days of grace will be abolished. The latter order means that persons who display 1913 tags on and after January 1 will be liable to arrest. Heretofore 30 days have been allowed to owners in which to procure licenses, but next year no car can be run on New Year's day without one of the olive green tags. On January 1, 1913, joint ownership of cars will be done away with as far as registering is concerned, and the name of but one person can be given as owner. All others who desire to operate the car must take out chauffeur licenses. It has been found that the privileges carried by joint ownership were much abused. On some applications for registration a dozen names were given as owners and all claimed the right to operate the car.

Louisville Announces Run—The Louisville Automobile Club will conduct a sociability run on November 9. The intention is to make a trip to Lexington, Ky. Awards will be made to the car making the run nearest to a secret time.

Lancasterites to Visit York—The Lancaster Motor Club, of Lancaster, Pa., will hold a sociability run from the Red Rose city to York on Saturday and will be the guests of the York Motor Club at the races held there that day and at the York Club's new home along the Wrightsville pike. A number of prizes will be offered to the drivers coming to York nearest to a secret time set by Mayor McClean, of Lancaster.

Good Roads Day—The germ of good highways is penetrating all over America, the latest example being in New Brunswick when the motorists on that island got together and observed October 12 as good roads day. Members of motor clubs went out over the most important roads there, putting up signs and making repairs where a little work of that kind was needed, setting an example that many motorists this side of the Canadian border might follow.

Lights on Standing Cars—Hereafter all motor cars left standing in the streets throughout Connecticut must have lights lit, the attorney-general having rendered an opinion to that effect on the section of the motor law. The matter was brought up recently on a question of whether a car left standing needed to be lit, and in rendering an opinion the state official said: "Now, when may a motor vehicle be said to be in use or operation upon the public highway? I am of the opinion that the words in use or in operation, as employed in the statute in question, include every situation of a motor vehicle in commission upon the public highway, and extend to such vehicles as are left stationary upon the highway while the occupants make a call or transact business. Therefore, at all times, when so used from half an hour after sunset to half an hour before sunrise, lights must be displayed on such vehicles."

Parade for Phoenix—Plans for a monster motor parade to be held on the streets of Phoenix, Ariz., the night of October 30 are being made. This parade will precede the track races scheduled for the next day and will be one of the principal events of the state fair.

To Use Convict Labor—The Kent county good roads commission is planning to employ prison labor on the construction of roads in the vicinity of Grand Rapids, Mich. The plan has been tried in Kalamazoo county. The commission is busy on the new roads for which the county recently bonded for $600,000.

Archdeacon Uses Motor Pulpit—His own chauffeur, and in cases of necessity his own organist, Archdeacon J. H. Dodshon, of the southern diocese of Ohio, Episcopal church, has been performing his duties through the mining region of southern Ohio with his car equipped with a portable organ. Often his services are conducted in the open air. The archdeacon stops his car under the trees, delivers his sermon, and, if there are no volunteers, takes his place at the organ and leads the singing.

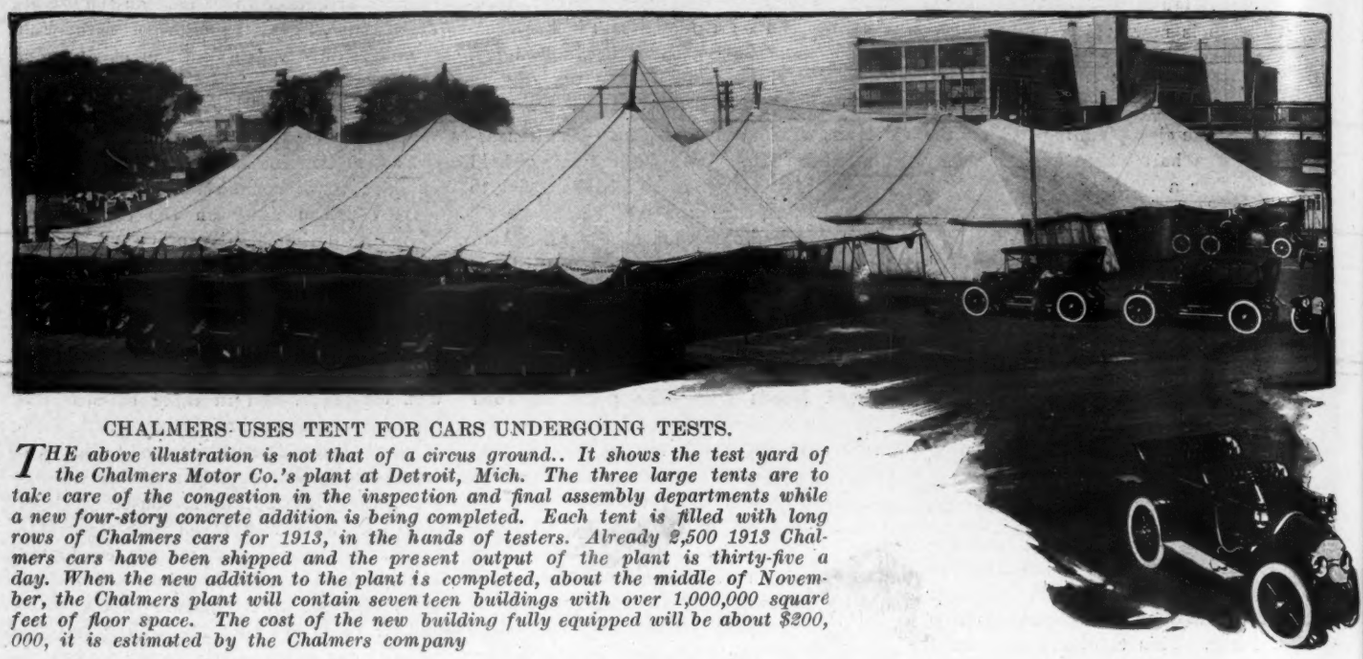
Columbus Wants a Show—The Columbus Automobile Club, of Columbus, O., is arranging to give a show some time during the winter. To that end a committee is making preliminary arrangement. It is believed the show will be soon after the holidays.

Columbus Talking Speedway—A special committee of the Columbus Automobile Club is canvassing the situation as to the building of a motor speedway in Columbus, O. It is proposed to build a dirt track with banked turns. No concrete surface will be used. To finance the undertaking a stock company will be formed. It is proposed to have a speedway of either 1½ or 2½ miles.

Raising Money for Roads—A strong campaign is being made in Minnesota for the passage at the fall election of the proposed amendment to the state constitution increasing the levy for highways in the state from ¼ mill to 1 mill. This will give a million or more for good roads. Under the peculiar state law a full vote will be required of all persons voting at the election to insure passage of the measure. Robert C. Dunn, of Princeton, author of the amendment, said this week that the rural district vote is practically assured for the measure and that the Twin Cities must wake up to their responsibility and help in putting the measure through.

BEDELIA RACING FREAK WITH RENAULT AIR-COOLED AVIATION MOTOR THAT PARTICIPATED IN FRENCH GAILLON CLIMB

Among the Makers and Dealers



CHALMERS USES TENT FOR CARS UNDERGOING TESTS.

THE above illustration is not that of a circus ground.. It shows the test yard of the Chalmers Motor Co.'s plant at Detroit, Mich. The three large tents are to take care of the congestion in the inspection and final assembly departments while a new four-story concrete addition is being completed. Each tent is filled with long rows of Chalmers cars for 1913, in the hands of testers. Already 2,500 1913 Chalmers cars have been shipped and the present output of the plant is thirty-five a day. When the new addition to the plant is completed, about the middle of November, the Chalmers plant will contain seventeen buildings with over 1,000,000 square feet of floor space. The cost of the new building fully equipped will be about $200, 000, it is estimated by the Chalmers company

DEAN to Make Otho Starter—The Dean Electric Co., Elyria, O., has taken over exclusive manufacturing rights and will produce in large quantities the Otho electric starter.

Baltimore Show in February—Preliminaries are being considered for the next annual show of the motor cars in Baltimore, it is estimated by the Chalmers company, under the auspices of the Automobile Club of Maryland and the Baltimore Automobile Dealers' Association. This show will more than likely be held again in February, but no definite date has been decided upon.

Taking Inventory, Not Quitting—The temporary shutting down of the Bowling Green Motor Car Co., Bowling Green, O., for the taking of an accurate inventory, gave rise to the rumor that the company had closed permanently. This is denied by the management, which declares that even when the inventory was being taken an emergency force was at work rushing out a carload of trucks for shipment to western concerns. The full force started to work again Monday.

Hopes to Continue—Attorney Edward W. Beattie, who is acting for the Atlas Motor Car Co., of Springfield, Mass., announces that despite the fact that three more attachments had been placed upon the company's property the outlook for resuming business is much brighter than ever, and there is a good prospect that all the financial difficulties of the company will be settled in the near future and the concern reorganized. At present the entire plant, with the exception of the repair department, is shut down, but Attorney Beattie states that if the plans under consideration go through it will mean the employment of a larger number of hands than before when the regular list totaled 140 employes.

Van Deusen Makes a Change—W. H. Van Deusen, assistant sales manager of the Abbott Motor Co., and formerly connected with the Chalmers Motor Co. and the E. R. Thomas company, has tendered his resignation. O. F. Schreiber has been promoted to fill the vacancy in the Abbott sales organization. He was connected with the Chalmers company at one time. M. L. Buck succeeds Mr. Schreiber.

More Room for Motor Show—Construction of the Armory annex for the February show in Minneapolis is proceeding so rapidly that the management of the show is assured the building will be ready complete for the exhibition. This building adjoins the Armory in which the main show has been held for years, and will add several thousand square feet show space and a balcony to the large amount of room at previous shows.

Daimler's French Affairs—Announcement is made that the English Daimler company will restrict its operations in Paris at the end of this month. The central show-rooms are to be closed and the headquarters of the English company confined to the repair department in the suburbs. The retail sales departments, in the hands of the various agents, remain unaffected. An order in bankruptcy has just been filed by Leonce Girardot, one time manager of the English Daimler company in Paris and earlier a member of the C. G. V. firm, now the Charron company. For the past 12 months Girardot has been agent for Darracq valveless motors and the Panhard-Levassor company, with a store in the Champs-Elysees.

Evans Off Lozier Staff—J. M. Evans, who for the past year has occupied the position of advertising manager of the Lozier company, has severed his connection with the Lozier interests.

Car Factory for Des Moines—Des Moines, Ia., is to have a new car factory to be known as the Cannon Motor Car Co. J. F. Cannon, of Detroit, has been making arrangements. The site of the new factory has not been determined upon. Two locations are already in view.

Ford Opening Paris Branch—After being chief selling agent for the Ford company for about five years, Henri Depasse has taken up the complete selling agency for the R. C. H. car in France. This move has become necessary on account of the decision of the Ford Motor Car Co. to establish its own branch in France, selling direct to the public and abolishing the general sales agent.

New Tire Concern—The Marathon Tire and Rubber Co., of Cuyahoga Falls, N. Y., has a large force of men at work on the main building of the plant, and as soon as same is under roof the installation of machinery will begin. It is expected to begin operations about November 1. The Marathon company was organized recently for the manufacture of tires, inner tubes and a general line of rubber goods. The board of directors consists of I. Walter Jenks, Pittsburgh; John R. Scott, Cleveland; C. W. Vaughn, Cuyahoga Falls; W. F. Ridge and W. H. Jenks, Akron. The officers of

the company are: John R. Scott, president; W. F. Ridge, vice-president and general manager; Walter H. Jenks, secretary and treasurer.

Bayerline Building a Car—A. G. Bayerline has secured manufacturing space in the plant of the King Motor Car Co., where he is at work on the car which he will shortly introduce to the motor world. Mr. Bayerline was formerly general manager of the Warren Motor Car Co.

Another Indianapolis Recruit—The Federal Motors Co. is preparing to erect an enormous plant in Indianapolis, the plans having been received. Contracts are to be let at once and the construction work started as soon as possible. The plant will consist of a one-story building several hundred feet long, to cost $150,000 exclusive of the machinery. The construction will be of brick, steel and reinforced construction and of the saw-tooth type, assuring a daylight plant. The new factory will be located in West Fifteenth street.

Walpole Company Incorporated—The recently formed Walpole Tire and Rubber Co., an adjunct to the Walpole Chemical Co., has been incorporated with a capital of $4,500,000, and its stockholders comprise men prominent in the business world of Boston and vicinity among them the following: Ernest W. Tinkham, Alvi T. Baldwin, Frederick J. Gleason, Elmore C. Green, Everett W. Furbush, Louis O. Duclos and John C. Blanchard, Jr. The tires are produced at the factory at Walpole, Mass., where an extensive rubber business has been carried on for years.

Continental Stock Increased—At a recent meeting of the directors of the Continental Motor Mfg. Co., the capital stock of the concern was increased from $500,000 to $2,400,000. Of this amount $900,000 was made preferred stock and $1,500,000 common. The latter will remain in the treasury to take care of present improvements and additions to the plant, as well as to cover any dividends to stockholders. According to President Tobin, the concern is in an exceedingly prosperous condition, the entire output of the large plant being sold up through August, 1913.

Packard's Paris Branch Moves—Business having increased in enormous proportions, R. N. Goode, European manager of the Packard Motor Car Co., has moved his headquarters from Boulevard Pereire to a handsome store in the Rue Newton, about 2 minutes' walk from the Place de l'Etoile and the Champs-Elysees. The Packard European depot is no longer a service depot only, but a selling branch, the Rue Newton store having on exhibition the leading models produced at the Detroit factory. The new headquarters are excellently situated in the heart of the wealthy residential and hotel district, and in that part of Paris best known to Americans. The European branch of the Packard company now has a sales department, a service depot, a hire department, and also repair shops in the suburbs of Paris. The hire department is reported to be busy with touring parties visiting the south of France and Italy.

Richmond Sets Show Dates—The spacious Horseshow building has been secured by the Richmond Automobile Dealers' Association for its first show, which will be held February 16-23, next. The sum of $10,000 will be expended in putting on the exhibition. There is a total floor space of 13,000 square feet and up to date there remains but about 2,000 square feet to be allotted, with quite a number of local dealers and accessories firms to hear from.

Sturdy Gets Sta-Rite Line—The Sturdy Mfg. Co., of Chicago, maker of Sturdy spark plugs, has taken over the Sta-Rite line of ignition plugs, consisting of the Venus, Vulcan and Gotham, due to the failure of the R. E. Hardy Co., which has manufactured these plugs since 1900. The Sta-Rite Vulcan plug is of the double porcelain type, the Venus, a mica plug, and the Gotham a single hollow porcelain spark plug. The Sturdy company also will build special brand spark plugs on a large scale for the 1913 season.

Fire on Pittsburgh's Row—Fire in the heart of the east end motor district in Pittsburgh, Pa., on the morning of October 16, caused a loss of about $8,000 and much worry among the dealers lest the blaze get beyond control of the firemen and spread. The flames broke out in the Abbott-Detroit agency at 221 Beatty street. There was great excitement for some time, the workers in other garages in the vicinity having a busy time of it getting out the cars from the buildings. The Essanay Tire Co., at 219 Beatty street, suffered some loss, as well as the Beatty Auto Repair Co., at 223.

Prospects Good in Northwest—One of the straws indicating to the wholesale car dealers and the branch managers that the outlook for sales is good in the northwest is the heavy contracting for new garages in all the states tributary. Weekly reports from architects, contractors and building exchanges show that the activity is heavy, and that in all the smaller cities not supplied with good central garages buildings are being remodeled for motor car purposes or are being built. In the Twin Cities several large structures are being erected or are contracted for, by some of the large dealers or by factory branches. Motor rows in the two cities are growing rapidly as the agents, managers and dealers show more clearly the gregarious instinct. No indication is on the surface of a lessening in the business. With bank clearings mounting fast, to show cash grain deliveries, and threshing crews enabled to work extensively, where the weather has been bad heretofore, the spirits of the dealers mount. Car congestion is reported as not serious as the railroads had made every precaution by abandoning construction work which would interfere with the movement of cars. Grain yards in the Twin City district were added to in the summer by heavy purchases of real estate and by adaptation of old yards to handling grain cars.

Timken Conference Held—The quarterly sales conference of the Timken Roller Bearing Co. and the Timken-Detroit Axle Co. was held at Canton, October 15. After the business session and supper the selling forces repaired to the auditorium, where Governor Johnson spoke.

To Make Gear-Shifters—Clark A. Oostdyke, former director of purchases of the General Motors Co., has incorporated the Oostdyke Gear Shifting Co., of Detroit, with $1,000,000 capital, to manufacture a gear-shifting device which does away with shifting levers on the car, the gears being operated from a keyboard on the wheel.

Lenox Increasing Capacity—The Lenox Motor Car Co. of Boston has made plans for a largely increased product for the coming season, and with this object in view it has secured the services of W. K. Hadley as general sales manager and purchasing agent. Mr. Hadley has just resigned as special factory representative of the Marion Sales Co. and prior to that was for 5 years with Maxwell-Briscoe.

To Make Steel Wheels—The Ideal Steel Wheel Co., a new Cincinnati corporation, has bought the former plant of the Seufferle Cooperage Co. on Spring Grove avenue, Winton place. The transaction of property is said to have involved $41,000. The general dimensions of the building just acquired are 200 by 226 feet, together with several minor structures. J. B. Fitch is president; J. E. Strielmeier, the inventor, vice-president; E. H. Massey, treasurer, and Harrie Walker, secretary and manager.

Minneapolis' Building Activities—Four motor car buildings are being constructed in Minneapolis for Andersch Brothers, Abbott-Detroit, to cost $35,000; for the Colby Motor Co., to cost $10,000, and for the Bowman & Libby, Inc., Overland, and the Goodyear Tire and Rubber Co., to cost $100,000. The Ford Motor Co. will erect a $200,000 building and the Avery company, Peoria, Ill., has bought a site for an implement and motor car building. The F. E. Murphy Automobile Co., Mitchell line, is erecting a $250,000 building.

Federal Increases Stock—The Federal Rubber Mfg. Co., of Milwaukee, Wis., with factory at Cudahy, Milwaukee county, has increased its capital stock from $1,000,000 to $2,000,000 to accommodate the remarkable growth of the business. Since January 1 the factory has been working night and day and the actual sales have exceeded the pre-season estimates by more than $400,000. During the past season the company has done extensive construction and improvement work, valued at nearly $500,000. A principal improvement was the construction of a new central power, lighting and heating plant aggregating 3,[illegible] boiler horsepower.

Development Briefs

Improvements in Goggles and in Cotter Pins—Gasoline Starter and Primer—Gasoline Gauge—Gas Lighter and Controller—More Ford Lighting Outfits

Sanitary Eye and Nose Shield

FIG. 1—CAMPBELL COTTER

AS A substitute for the cumbersome, uncomfortable, and unsightly goggles that are often worn, the Sanitary Sales Co., Bradford, Pa., offers the eye-shield shown in Fig. 3. It consists of a celluloid pane, bound with a cushioning tape, and fitted with attaching bands, with a gauze strip beneath the nose, which excludes dust from the nostrils. The pane is well away from the face, so that spots on its exterior will not affect the eyes, and permitting it to be worn over glasses. The celluloid is made in plain, amber, blue, and green shades, and the shield as a whole weighs but ½ ounce. It is sold in a leather case, which protects it from injury when not in use. Being of celluloid, cloth and gauze, there is nothing to break if accidentally dropped.

Safety Gasoline Gauge

Glass stand-pipe gasoline gauges are most convenient to read and are little affected by road vibration and jouncing, but they possess the fault, in most instances, of the danger in case of breakage. Connected as they usually are directly to the gasoline line, if the glass tube becomes broken, the gasoline is allowed to leak out of the gauge until the supply cock in some inaccessible portion of the car is turned off. To conserve the good points of the glass gauge, and yet eradicate this drawback, the Emergency Safety Co., Port Huron, Mich., has produced the Safety gasoline gauge, Fig. 4. This gauge may be applied to any convenient portion of the car, within reach of the driver. It differs from others of its type in that the feed to the gauge is not constant, but is through a valve, normally closed, which is opened by pressure on the push-button on top of the stand-pipe. To read the gauge, this button is pressed. This simple device affords the owner a positive means of determining the fuel consumption of his car, as after a reading, the level in the gauge remains the same until the button is again pressed, when the difference in level can be accurately noted. In the same manner, the owner can know positively how much gasoline is being put into his tank, when a supply is already contained therein. In case of breakage of the glass, only the fluid contained in the tube is lost.

Webb Jay Primer

It is in cold weather that a good primer is appreciated, and if the claims of the Fowler Lamp and Mfg. Co., Chicago, are substantiated, the Webb Jay automatic suction priming system should come in for a large amount of appreciation. On the principle that it is gasoline that must bring the first response of the engine, regardless of the manner of starting, or the form of starter used, the inventor of this device has designed a starting primer that differs considerably from others of its kind. The chief difference is that the gasoline, un-carbureted, is introduced through the inlet valves, on the dying revolutions of the motor, where it is partially vaporized by the heat of the cylinders, thus giving a much better fuel for starting a cold motor than cold liquid gasoline introduced after the motor had cooled. There is no pressure to be pumped up in the Webb Jay system, the suction of the motor drawing the fluid from a bi-pass in the gasoline line to a reservoir on the front of the dash, and through a valve to the inlet manifold lead. This valve is the only visible portion of the device, and is operated upon the dying revolutions of the engine, just after the switch is turned off. The supply in the reservoir is for the purpose of priming the motor after the car is left standing for some time, when all of the gasoline left in the cylinders on stopping would have evaporated. This system is adapted to either pressure or gravity feeds, as shown in Fig. 2.

FIG. 3—SANITARY EYE AND NOSE SHIELD

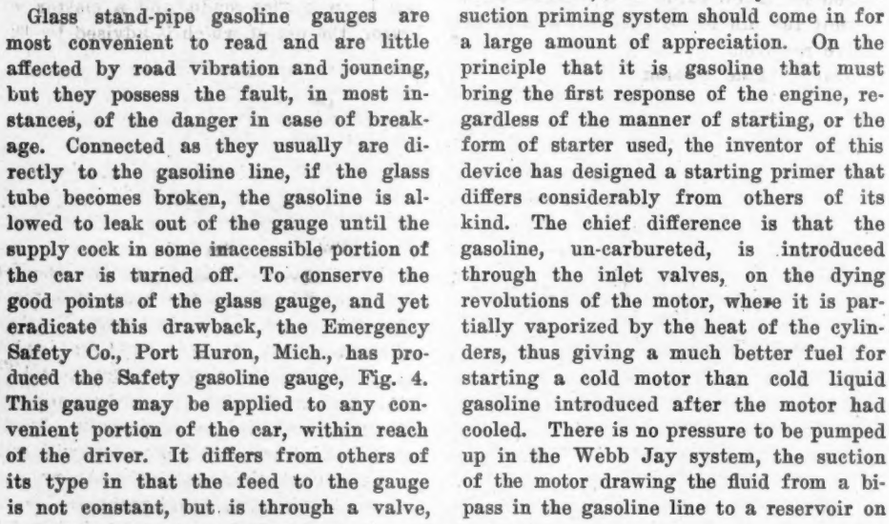

PRIMING CUP
OPERATING HANDLE
MAIN FEED FROM GASOLINE TANK
CONNECTION TO BOWL OF CARBURETOR WHEN AIR PRESSURE IS USED ON GASOLINE TANK

FIG. 2—WEBB JAY STARTER AND PRIMER

Gray Specialties

One of a complete line of tire sundries manufactured by the Gray Specialty Co., Newark, N. J., is an especially interesting spare tire outfit. This outfit has been selected with a view to providing the private owner with just the material he will need for ordinary repairs, in the most convenient form, and consuming the minimum of space. The outfit includes cement, acid, rubber putty, adhesive tube patches, emery paper, brushes, repair plaster, assorted blow-out patches, and an outside boot with laces. This outfit is made in several sizes, and in a smaller edition, known as the tourist's outfit, which is similar, but not so complete.

Campbell Cotter Pin

In many instances the insertion and extraction of cotter pins in a motor car is a decidedly ticklish job, using the ordinary type, due to the fact that in order to spread the prongs, the head must be held in place, while the prongs are spread with a screw-driver, flat-peen hammer, or cotter tool. In other words, it involves working on both sides of the bolt or rod, through which the pin is inserted. The same difficulties apply to the extraction of the pin,

and are greatly enhanced by the inaccessible locations of many of the parts which use this form of fastening. To overcome these difficulties, A. C. Campbell, Waterbury, Conn., has produced the spring cotter shown in Fig. 1. This cotter is inserted, locked, and withdrawn all from one side. Inserting it, a tap on the eye, drives the shorter leg over the hooked longer one, and spreads it, as shown, while a screwdriver, twisted in the direction of the arrow, draws it back to its original position, permitting it to be withdrawn, and used again if need be. These pins are sold in boxed assortments especially designed for the use of motorists.

Aubeuf Dimmer and Lighter

That many accidents to motor cars are due to the blinding glare of the headlights is an incontrovertible fact, and its recognition by the legal authorities has inspired many inventors to produce remedies for this glare, which reduce the dazzle, without imparing the use for which the headlights were intended. The

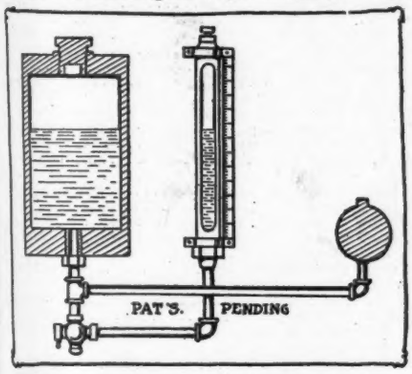


FIG. 4—SAFETY GASOLINE GAUGE

Aubeuf Dimmer is one of these. It consists of a simple gas cock with a convenient operating lever which is placed in a convenient position to the driver, being interposed in the gas line between the lamps and the tank or generator. The lighting feature consists of sparking points on the burners of the lamps which are wired through a switch on the dash to one of the plugs, shorting it when the circuit is closed by means of the switch, causing the high-tension current to flow through the lighting wires, and spark at the lamps. This outfit affords an advantage not possessed by electric lights, viz. —dimunition of the light, and at the same time possesses the advantage of the latter of lighting and extinguishment from the seats.

Merz Valve-Spring Release

In removing valves and stems for replacement, a good valve-spring release is indispensable. Fig. 5 shows such a one. The Merz valve-spring release is the product of H. B. Merz, Pittsburgh, Pa., and is in the form of a malleable three-part screw clamp, the lower jaw of which is bifurcated to straddle the stem, and fitted with an adjustable gauge, which centers the fork on the stem, preventing the bending of the stem. The lower or fixed jaw

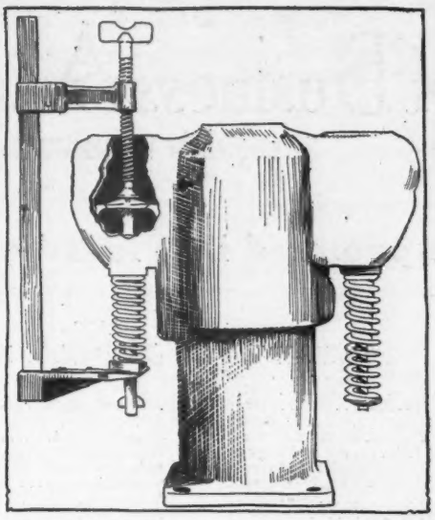


FIG. 5—MERZ VALVE-SPRING RELEASE

is removable to permit it to be stored in the tool box. The sliding jaw slides freely, but binds instantly upon the thumb screw being turned, locking it positively, until the pressure on the thumb screw is relieved, when it again is free to slide. The pivoted pad at the lower portion of the screw is fitted with a lug that fits the slot in the valve head, thus holding the upper portion of the device in center. When set, a few turns of the thumb screw permit the pin to be withdrawn, and the valve removed.

Romort Engine Cleaner

Cleaning the engine is a task that is usually most disagreeable, and for this reason, and the fact that it is enclosed in the hood, out of sight and mind, it is frequently neglected shamefully. The chief reason for this is the crude way in which this operation is usually performed. To take the place of rags and waste in this connection, and do their work more quickly and economically, the Romort engine cleaner is manufactured by the Romort Valve Co., Portland, Ore., as shown in Fig. 7. It consists of a cylindrical trank 20½ inches long by 4 inches in diameter, which holds two quarts of coal-oil. It has a spout at one end, terminating in a fine nozzle. At the other end, an air connection is situated. In use the tank is filled with the fluid, and the air line from a tank or pump is connected to the nipple C. The air is blown through the nozzle, carrying with it a fine spray of fluid, which is projected with great force. It is claimed that this device will clean an engine quickly and easily, and that it will clean the nooks and crevices as thoroughly as the more prominent portions. The air feed is adjustable by means of the packing nut, D, to produce a strong or moderate spray. In using this cleaner, the coal-oil is poured in at the top and the air connection made, when a small and powerful jet of vapor will issue from the nozzle.

A. H. G. Ford Accessories

Manufacturing and selling special accessories for Ford cars is becoming a separate and distinct business. Notable among makers engaging in this sort of specialization is the A. Hazen-Green Co., New York. Lighting outfits, master vibrators, and an oiling system comprise its line. The headlight outfits number three, all electric, taking current direct from the Ford magneto. The outfits are complete in each instance, and the price is remarkably low. One lighting outfit consists of a complete equipment, except lamps, for use as an adapter of regular Ford lamps to electric light. An electric tail lamp is also made, and a master vibrator, the use of which is advised by the

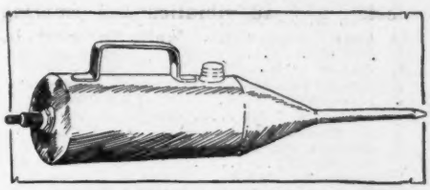


FIG. 7—ROMORT ENGINE CLEANER

maker in connection with the ignition, when current is taken from the magneto for lighting. The oiling outfit is a pressure system, with a sight-feed that is said to enable the driver to know at all times the state of his lubrication. This system does not, it is said, interfere with the regular splash system, but takes the oil supply from the same reservoir.

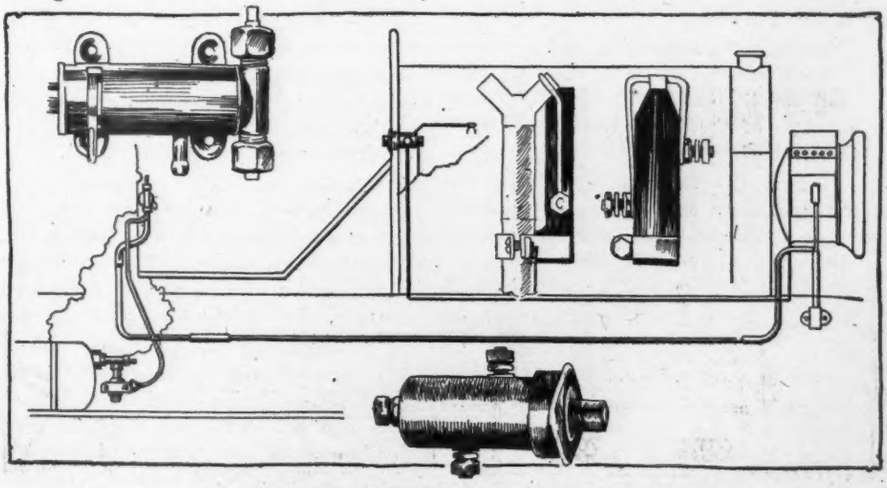


FIG. 6—AUBEUF LIGHTER AND GAS CONTROLLER

Brief Business Announcements

Recent Agencies Appointed by Pleasure Car Manufacturers

Town—	Agent	Car
Abie, Neb	Maseck Brothers	Reo
Abie, Neb	Maseck Brothers	Little
Ainsworth, Neb	M. L. Smith	Reo
Ainsworth, Neb	M. L. Smith	Little
Albion, Neb	Point & Allen	Reo
Albion, Neb	Point & Allen	Little
Aurora, Ill	O. N. Staley	Abbott-Detroit
Baltimore, O	Neeley & Ensor	Klinekar
Beecher, Ill	H. Wehmhoefer	Abbott-Detroit
Beloit, Wis	L. D. Allen & Co	Abbott-Detroit
Brooklyn, N. Y	C. & C. Auto Co	Klinekar
Buffalo, N. Y	Windsor Motor Car Co	Klinekar
Callaway, Neb	Corothers & Sherrel	Studebaker
Charlotte, N. C	Klinekar	Klinekar
Chicago	Adlake Livery Co	Abbott-Detroit
Chicago	Julius Debits	Abbott-Detroit
Chicago	Barry Garage	R. C. H.
Columbus, O	E. J. Thornton	Winton
Columbus, O	Franklin Cycle & Supply Co	Cole
Columbus, O	Adamson Auto Co	Jackson
Columbus, O	Adamson Auto Co	Detroiter
Columbus, O	Brewer Auto Sales Co	Lion
Corning, N. Y	Max Wolcott Garage	R. C. H.
Crete, Neb	Vaclov Sebek	Cartercar
Danville, Ill	O. E. Newman	Abbott-Detroit
Darlington, Wis	A. C. Poole	Abbott-Detroit
Deerfield, Ill	Deerfield Garage	Abbott-Detroit
Delaware, O	Cook Motor Car Co	Detroiter
Des Moines, Ia	Van Vliet Bradt Motors Co	Moon
Dewitt, Neb	O. W. Wiebel	Cartercar
Dorchester, Neb	John Freehoff	Cartercar
Dorranceton, Pa	Gilbert H. Edgar	Klinekar
Edgar, Neb	Edgar Auto Co	Studebaker
Elgin, Ill	Moody's Garage	Abbott-Detroit
Erwin, Ia	Southall & Hanson	Reo
Erwin, Ia	Southall & Hanson	Little
Fairbury, Neb	Friessed Imp. Co	Studebaker
Fall River, Mass	F. W. Davis & Sons	Cole
Fort Gaines, Ga	W. W. Calhoun	R. C. H.
Franklin, Pa	King Automobile Co	Klinekar
Grand Island, Neb	Jarvis & Boyder	Reo
Grand Island, Neb	Jarvis & Boyder	Little
Haverhill, Mass	Haverhill Motor Car Co	Rambler
Herman, Neb	Schrenk & McDonald	Studebaker
Hinckley, Ill	C. C. Kennedy	Abbott-Detroit
Johnstown, Pa	Atlas Motor Car & Supply Co	Klinekar
Joliet, Ill	Joliet Motor Car Co	Abbott-Detroit
Jonesville, Mich	Grant S. Emery	R. C. H.
Kalamazoo, Mich	Newton Root	R. C. H.
Kasbeer, Ill	Riley & Co	Abbott-Detroit
Kiron, Ia	August Kastner	Lexington
LaGrange, Ill	H. D. Howe	Abbott-Detroit
Lancaster, O	C. E. Pline	Detroiter
Lancaster, Pa	S. E. Bailey & Co	Klinekar
Littletown, Pa	L. M. Alleman	Klinekar
Lima, O	Oakland Co	Oakland
Louisville, Ky	Clark Motor Car Co	Premier
Lowell, Mass	Arthur J. Cummiskey	Stutz
McCool, Neb	Hebreck & Lincoln	Cartercar
Milwaukee, Wis	Bates-Odenbrett Auto. Co	Abbott-Detroit
Massbach, Ill	Rudolph Dittmar	R. C. H.
Minneapolis, Minn	A. F. Chase & Co	Havers
Mt. Sterling, O	Baxter & Neff	Detroiter
Marion, O	Hill & Hipsher	Detroiter
Montreal, Can	E. Rivet	Cartercar
Montreal, Can	Royal Automobile Co	Cole
Maxwell, Neb	O. P. Madsen	Reo
Maxwell, Neb	O. P. Madsen	Little
Newark, N. J	A. N. Brunner	Klinekar
Newberry, Mich	Perry & Westin	R. C. H.
No. Lewisburg, O	Willis Auto Co	Detroiter
Neligh, Neb	C. M. Cassidy	Reo
Neligh, Neb	C. M. Cassidy	Little
Norfolk, Va	C. L. Young	Klinekar
Providence, R. I	Oldsmobile Co. of R. I	Oldsmobile
Palmerton, Pa	K. W. R. Detwiller	R. C. H.
Philadelphia, Pa	Klinekar Sales Co	Klinekar
Pittsburgh, Pa	Klinekar Motor Co	Klinekar
Pawtucket, R. I	Pawtucket Auto Co	Cole
Reading, Pa	D. B. Hoffer & Sons	Klinekar
Richmond, Va	Foster Motor Car Co	Klinekar
Rockford, Ill	F. L. Miller Auto Co	Abbott-Detroit
Roseland, Ill	A. Vincent & Sons	Abbott-Detroit
Rockwood, Pa	P. E. Weimer	R. C. H.
Stratton, Colo	A. S. Baker & Son	R. C. H.
San Francisco, Cal	F. O. Renstrom	Klinekar
Springfield, Mass	Maynard Rubber Co	Studebaker
Sumner, Neb	D. J. Yost	Maxwell
Sidney, Neb	Livona & Son	Reo
Sidney, Neb	Livona & Son	Little
Scranton, Pa	A. J. Schnell	Klinekar
So. Omaha, Neb	Holmes-Atkins Co	Lexington
Urbana, O	Only Garage	Detroiter
Utica, O	H. E. Edwards	Detroiter
Urbana, O	Dallas McCrery, Jr	Mitchell
Utica, Neb	P. S. Boone	Cartercar
Valentine, Neb	G. S. Brown	Studebaker
Venango, Neb	C. M. Weyerds	Studebaker
Worcester, Mass	Palace Auto Station	Cole
Walnut, Ill	J. C. Burchell	Abbott-Detroit
Williamsburg, Pa	V. H. Hancuff and E. Shelly	R. C. H.
Wilber, Neb	Kohout & Greer	Maxwell
Waterloo, Ia	Corn Belt Auto Co	Hupp-Yeats
York, Neb	Mulick Manufacturing Co	Cartercar
Youngstown, O	Thomas Motor Car Co	Klinekar
Yutan, Neb	J. W. Schlesinger	Studebaker
Zanesville, O	Valley Motor Co	Cadillac

SASKATOON, SASK.—V. G. Graham has opened a garage here.

San Francisco, Cal.—R. L. Forsyth has been appointed sales manager of the Thomas Flyer Co., a retailing car agency in San Francisco.

Indianapolis, Ind.—H. C. Waite, formerly factory manager of the G & J Tire Co. at Indianapolis, has been appointed general manager of the Reeve Rubber Co., Providence, R. I.

Akron, O.—The Buckeye Rubber Co. will soon start the erection of a one-story brick and concrete addition to its factory which will be 40 by 120 feet. More room is needed because of a growing business.

Columbus, O.—The Maxwell-Interstate Co. has been formed by Ross Shaw and James Westwater, to act as agent for the Maxwell and Inter-State lines in central Ohio. The concern is located at 248 North Fourth street, where the United Motors-Columbus Co. is housed. The Maxwell-Inter-State Co. has Franklin county on the Maxwell and sixteen counties for the Inter-State.

Scott, Sask.—William Hook has purchased a garage here.

Seattle, Wash.—H. P. Grant is back in the industry and has established a garage and repair shop at 1423 Tenth avenue.

Indianapolis, Ind.—H. A. Elmer, president and general manager of the Grant Motor Car Co., has resigned. His future plans have not yet been divulged.

Washington, D. C.—The Henderson-Rowe Auto Co. has been formed to take over the business of Theo. Barnes, Jr., & Co., Pullman agents. The new company has leased a salesroom at 1127 Fourteenth street and will add the Little to its line.

Philadelphia, Pa.—The Tioga Automobile Co., 332 North Broad street, distributor of the National and Hupmobile cars, has removed to its new sales and service building, southeast corner of Broad and Tioga streets. The vacated quarters at 332 North Broad street have been taken by the Wallace Automobile Co., with the Pope-Hartford.

Buffalo, N. Y.—The Iroquois Rubber Co. is agent now for the G & J tire.

Portland, Ore.—Herbert L. Wilson has recently been appointed western Washington representative of the Studebaker Corporation.

Toronto, Ont.—The Rambler agency for Toronto and vicinity has recently been taken over by C. A. Finzel, late manager of the White American Sales Co., Toronto.

Portland, Ore.—The new Stutz agency has opened on Portland's row in the Winton building at Twenty-third and Washington streets. H. I. Mann, of Portland, is the president and F. J. Finger is sales manager.

Baltimore, Md.—Several more Detroiter agencies have been placed by Manager R. H. Croxton, of the Detroiter-Baltimore Co., representing the Detroiter car in Maryland and Virginia. He established an agency with Clarence Winstead to represent the Detroiter in three counties of

North Carolina, with Elm City as the headquarters.

Toronto, Ont.—The Prest-O-Lite Co., of Indianapolis, has opened a branch at 722 Yonge street.

Stockton, Cal.—Hanke & Gall, distributors for San Joaquin county, Cal., for the Haynes car, are to erect a new garage at Stockton

Columbus, O.—The Broad-Oak Automobile Co., located at 622 Oak street, which was recently taken over by William J. Miller and R. M. Weaver, has opened a repair shop.

Vancouver, B. C.—Bert Ford and T. G. Forshaw, of the B. C. Auto Co., have just been appointed special factory representatives in British Columbia for the Cole Motor Car Co., of Indianapolis, Ind.

San Francisco, Cal.—The Federal Rubber and Mfg. Co. will shortly open a factory branch in San Francisco, which will be in charge of E. L. Rettig, for the past 12 years connected with the Diamond Rubber Co.

Eureka, Ill.—Stumpf & Unsicker, of Eureka, Overland agents, are building a new brick garage 50 by 110 feet. The Eureka Motor Co., E-M-F agent, is erecting a new brick fire-proof garage 50 by 105 feet.

San Francisco, Cal.—The Imperial Automobile Co. is the latest motor car manufacturer to establish a factory branch in San Francisco. G. A. Troutt will take over the Imperial interests for the entire Pacific coast.

Boston, Mass.—E. L. Vail, for the past 4 years manager of the Boston branch of the Splitdorf Co., has resigned, and is now associated with the Hoffecker company as sales manager of the Hoffecker speedometer.

Washington, D. C.—The Storm Motor Co., which has had the agency for the Hudson and National, has gone out of business. The Hudson agency has been taken over by R. A. Klock and a number of other business men, who will form a company to handle that car in addition to the Columbia and Hupp-Yeats electric.

Washington, D. C.—Fred L. Harveycutter and Thornton Chesley have purchased the branch business of the Kelly-Springfield Tire Co., 1730 Fourteenth street, N. W., and will conduct it under the name of the Kelly-Springfield Tire Co. Harveycutter formerly was manager for George Meeley, agent for Firestone tires.

New Orleans, La.—With a capitalization of $1,000,000 the Ezeride Filler Co. has been incorporated under the laws of Louisiana. The offices of the company have been opened at their plant here. The company will exploit the patents of the late Edward J. Larkin. The officers of the new company are Ruffin R. Barrow, president; Gordon S. Orme, first vice-president; John H. Fulton, second vice-president; J. F. Anderson, secretary. These with Daniel D. Curran, Harry H. Osborn and J. Blanc Morgan form the board of directors.

Vancouver, B. C.—The A. Walker Auto Co. is now located in the new quarters, 1840 Georgia street.

Brandon, Man.—A two-story brick garage, measuring 60 by 120 feet, is to be erected here for Denison Brothers on Seventh street.

Buffalo, N. Y.—S. E. Hickman has been appointed Stevens-Duryea special representative for the Buffalo territory, with offices in the Hotel Lafayette.

Baltimore, Md.—The Rittenhouse-Winterson Co., which represents the Cartercar and Seitz truck in Maryland, has moved to new and larger quarters at 602 Water street.

Indianapolis, Ind.—Harlow Hyde, late of the Cole Motor Car Co., Indianapolis, and previously advertising manager of the Bosch Magneto Co., has been made advertising manager of the Empire Automobile Co., Indianapolis.

Vancouver, B. C.—To take up his new duties as manager of the local Goodyear tire branch E. C. McConnell, formerly manager of this concern's store in Calgary, has arrived in this city. Mr. McConnell succeeds F. C. Geary.

Washington, D. C.—The Auto Exchange and Supply Co., 1722 Fourteenth street, N. W., has changed its name to the Washington Car Equipment Co., and will shortly remove to larger quarters at 1327 New York avenue, N. W.

Portland, Ore.—J. Stanley Clemens, for a long time manager of the Portland branch of Chanclor & Lyons, accessory dealers, has resigned and will enter the retail car business in Portland. His successor is George E. Johnson, of Seattle.

Washington, D. C.—Robert H. Martin has been appointed manager of the Buick Motor Co.'s branch at 1028 Connecticut avenue, N. W., succeeding T. S. Johnson, who has been made eastern sales manager of the Republic Motor Co.

Savannah, Ga.—The Atlanta Taxicab Co., recently placed in the hands of a receiver by the superior court of Fulton county, has voluntarily surrendered its charter. Elliott E. Cheatham, who had been named temporary receiver for the company, was made permanent receiver.

Syracuse, N. Y.—A transfer of importance locally is announced in the purchase by C. Arthur Benjamin, Inc., of the James Auto Co. This consolidates two of the largest firms in the city. F. C. Benson, who has been in charge of the James Auto Co., will continue as sales manager, but the Hudson and Little cars, the agencies for which have been handled by the James Auto Co., will be sold at the Benjamin sales rooms, 410 West Onondaga street. The sales rooms of the James company in Taylor street will be continued as a service station and repair work, etc., will continue there. The repair department of the Benjamin plant will be supplanted by a corner show room.

Picton, N. S.—Dodd Dwyer has opened a garage, accessory station and motor livery on Creighton street.

Vernon, B. C.—George B. Forsythe and associates of this city are erecting a new garage which will be opened in the near future. The concern will handle the Ford line for the territory.

Madison, Wis.—The Galena-Signal Oil Co., a Pennsylvania corporation capitalized at $10,000,000, has filed articles and a statement to do business in Wisconsin. The local interest is given at $10,775.

Moose Jaw, Sask.—The Canadian garage of this city is building new premises at the corner of Tenth and High streets. The structure will be two stories—to be increased to six—of re-enforced concrete, measuring 72 by 75 feet, and will cost $25,000.

Vancouver, B. C.—To Vancouver's already large list of garages there is still to be another added. Work has been begun on the new $50,000 garage to be erected by the Tudhope Motor Car Co. at the corner of Fifth avenue and Granville street.

Elmira, N. Y.—Roy C. Stage, proprietor of the Electric garage, has filed a voluntary petition in bankruptcy in the United States district court. His liabilities were listed at $1,341.34 with assets of $499.63. Among the creditors is the Diamond Rubber Co.

Los Angeles, Cal.—H. O. Harrison has announced plans for a large two-story garage and salesroom to be built in Los Angeles. The new building will be at the corner of Pico and Flower streets. Harrison has also secured the Flanders line for the state of California.

Columbus, O.—The J. C. Sherwood Rubber Co., which was incorporated recently with a capital of $20,000, will handle the U. S. tires in central Ohio territory. The place of business is located at Fourth and Chestnut streets and J. C. Sherwood is president of the company.

Washington, D. C.—The Dupont Garage Co., conducting a garage at 2020 M street, N. W., has organized a sales department and will handle the Hudson, Columbia and Hupp-Yeats electric. R. A. Klock, formerly with the United Motor Washington Co., will be manager and the sales department will be located at 1321 Fourteenth street, N. W.

San Francisco, Cal.—Work on the new Don Lee Cadillac home at California street and Van Ness avenue, San Francisco, is progressing and will soon be ready for occupancy. The Don Lee company is in its new building in Los Angeles, and work will start at once on the branch house in Sacramento. The Fresno branch is completed. The Los Angeles building is three stories in height, and in addition to a garage, shop and salesroom there will be upholstery,

body building and painting departments on the upper floor.

Yorkton, Sask.—J. E. D'Oust has opened a garage and machine shop. The building measures 30 by 50 feet.

Buffalo, N. Y.—The new factory building and sales branch of the Buffalo Electric Vehicle Co., at 1219-1223 Main street, have been opened.

Vancouver, B. C.—O. J. Fox, 975 Main street, has taken the agency for the Dayton truck, and as soon as he can wind up the affairs of Fox Brothers will devote his time to the new venture.

Washington, D. C.—J. H. Earle, formerly of Earle & Allen, a firm that was dissolved several months ago, has secured the Oakland agency and will have quarters with M. T. Pollock, who handles the Oldsmobile at 1018 Connecticut avenue, N. W.

Vancouver, B. C.—The demand among motorists of Vancouver and tributary territory for the latest Oldsmobile cars and Kelly trucks has come to a head in the announcement that a large new garage is to be erected by the Archibald Auto Co. at a cost of $30,000.

Portland, Ore.—Bolton, McFarland & Co., Incorporated, is the new firm name of the Marion distributors for the state of Oregon and the southern part of Washington. They succeed the firm known as the Crowe Auto Co., which has had the agency for the Marion and others in the Oregon territory for the past year. L. E. Crowe and H. A. Burgess, who were known by the firm name of the Crowe Auto Co., have secured the southern California agency for the Marion cars and have left to take up their new territory.

Burlington, Wis.—W. V. Smart has been appointed sales manager of the Raymond C. Agner Auto Accessories Co.

Windsor, Ont.—Frank Miermicke has leased the ground floor of the Ferris building at the corner of Pitt and Ferry streets, and opened a garage.

Baltimore, Md.—The Colonial Motor Co., which is holding down the Studebaker line in this section, has taken on the agency for the Universal truck. W. E. Hayes, formerly with the Studebaker factory, is acting as sales manager for the Colonial company.

Canton, O.—Papers have been filed with the secretary of state increasing the capital stock of the Knight Tire and Rubber Co., of Canton, from $500,000 to $1,500,000. The increased capital is for the purpose of making large extensions and improvements at the plant.

Winnipeg, Man.—P. F. Plews and his brother, formerly with the Joseph Maw Co., Winnipeg, have severed their connection with that firm and have taken the agency for the Reo for Winnipeg. The firm will be known as the Plews Automobile Co. of Winnipeg.

Toledo, O.—The Gamble Motor Car Co. is to have a new home. The building now occupied by this concern will be remodeled and enlarged. An addition 60 by 130 feet will be made on the Thirteenth street side which will give a frontage of 130 feet on Thirteenth street and a depth of 100 feet. The Madison avenue front will be entirely remodeled, as will the entire interior of the old part.

Minnedosa, Man.—J. W. Campbell & Son have erected a garage here. It is the first garage to be built in this vicinity.

Washington, D. C.—The Henderson-Rowe Auto Co. has removed from 1222 H street, N. W., to 1127 Fourteenth street, N. W. In addition to the Pullman the company will also handle the Little.

Washington, D. C.—The Miller Co. has been formed to handle the Stutz. A salesroom will be opened at 1026 Connecticut avenue, N. W., formerly occupied by the Goodyear Tire and Rubber Co.

Buffalo, N. Y.—E. E. Denniston has been appointed by the Stewart Motor Corporation manager for the district covering the states of Illinois, Iowa and Missouri for the new motor truck concern.

Toronto, Ont.—The Maxwell-Stoddard Ontario Co. is one of the new firms entering the field in Toronto. N. D. M. Phillips is vice-president of the company and offices are situated at 475 Spadina avenue.

Toronto, Ont.—W. T. Butler has been appointed Canadian distributor for the Lippard-Stewart commercial car, which was introduced for the first time in this country at the Canadian national exhibition.

Detroit, Mich.—Walter H. Van Deusen, assistant general sales manager of the Abbott Car Co., Detroit, Mich., resigned October 1. After taking a short vacation, it is understood that Mr. Van Deusen will take a position as the head of a corporation now in the process of development.

Recent Incorporations

Acton, Mass.—Davis-King Co., capital stock, $20,000; motor car business; incorporators, A. W. Davis, H. E. Mead, B. A. King.

Atlantic City, N. J.—Holland-Donnelly Co., capital stock, $100,000; to conduct general motor car business; incorporators, E. J. Holland, E. R. Donnelly, G. C. Donnelly, H. L. Gibereen.

Benton, Ill.—Benton Motor Car Co., capital stock, $65,000; to manufacture motor cars and accessories; incorporators, H. Atotlar, W. S. Cantrell, A. H. Feaunfelder.

Boston, Mass.—Ultra Motor Car Co., capital stock, $100,000; incorporators, R. H. Randall, E. A. Bagg, C. A. Parker.

Boston, Mass.—Cosmopolitan Rubber Co., capital stock, $2,500; deal in rubber goods; incorporators, S. Miller, E. Miller, B. Levenson.

Brooklyn, N. Y.—Kings County Automobile Owners' Association, capital stock, $2,000; incorporators, M. M. Homiwich, A. Lenick, L. S. Harris.

Buffalo, N. Y.—Up-to-Date Auto Body & Specialty Co., capital stock, $2,500; incorporators, L. Dreyer, E. H. Dreyer, G. P. Askin.

Charlottesville, Va.—Jefferson Garage Co.; incorporators, W. B. Jones, R. L. Thomas, C. E. Blume, E. L. Thurston.

Charlotte, N. C.—Charlotte Storage Battery & Mfg. Co., capital stock, $100,000; to manufacture batteries; incorporators, J. W. Garrett, B. Garrett, C. A. Duckworth.

Cleveland, O.—Ideal Tool & Specialty Co., capital stock, $15,000; to manufacture accessories; incorporators, J. C. McLeland, G. E. Penty, G. P. Moulton, J. A. Hecker, C. Fuller.

Columbus, O.—Kelly Springfield Motor Truck Co., capital stock, $2,500,000.

Columbus, O.—Columbus Auto Parts Co., capital stock, $25,000; repair business; incorporators, C. J. Krag, R. E. Klages, J. J. Stoddart, W. D. McKinney.

Connersville, Ind.—Lexington Sales Co., capital stock, $100,000; to sell motor car parts; incorporators, M. W. Tichenor, E. B. Lilly, W. M. Place.

Des Moines, Ia.—Van Vliet-Bradt Motors Co., capital stock, $10,000; incorporators, W. E. Moyer, W. J. Bradt, C. G. Van Vliet.

Dayton, O.—McVey Mfg. Co., capital stock, $60,000; to manufacture accessories; incorporators, J. L. McVey, W. C. Fraine, A. N. Burkhart, M. Galloway, R. J. McCarty.

Jacksonville, Fla.—Atkinson Tire & Supply Co., capital stock, $25,000; incorporator, R. L. Atkinson.

Jersey City, N. J.—Delion Tire & Rubber Co., capital stock, $500,000; to manufacture rubber goods; incorporators, H. O. Coughlan, T. K. Mallaby, H. T. Letts.

Joliet, Ill.—Joliet Auto Supply Co., capital stock, $5,000; incorporators, B. S. Moore, T. J. Bracker, J. H. Garnsey.

Lowell, Mass.—Patterson Rubber Co., capital stock, $500,000; deal in tires; incorporators, J. S. Patterson, F. H. Appleton, F. H. Appleton, Jr.

Newark, N. J.—Charles E. Ball, capital stock, $100,000; to deal in motor cars; incorporators, C. E. Ball, Jr., R. Whitlock, S. M. Cady.

Newark, N. J.—American Auto Radiator Works, capital stock, $25,000; to manufacture radiators; incorporators, M. Steiner, A. Marcus.

Newark, N. J.—Continental Garage Co., capital stock, $10,000; incorporators, L. Kirkpatrick, R. C. German, S. A. Young.

New York—Faissole Auto Co., capital stock, $25,000; incorporators, A. Karlin, L. Lapides, A. Faissole.

New York—Bryant Auto Painting Co., capital stock, $2,000; incorporators, A. Berkowitz, B. Davis, P. Ostruk.

New York—Atlas Tire Co., capital stock, $10,000; to manufacture tires; incorporators, R. W. Morrison, R. D. Placak, F. F. Nichols.

New York—Light Car Corp., capital stock, $500; incorporators, J. F. Myers, O. R. McMahon, W. P. Myers.

New York—Reliable Auto Parts Co., capital stock, $2,000; incorporators, A. J. Lunde, H. Hansen, A. Sachroff.

New York—Distributing & Importing Co., capital stock, $100,000; motor car business; incorporators, P. LaCroix, H. T. Andrews, H. A. Miller.

New York—Snowden Rubber Co., capital stock, $1,000; to manufacture tires; incorporators, W. T. Snoden, E. J. Landgraff, A. Sidney Galitzka.

North Tonawanda, N. Y.—Twin City Auto Co., capital stock, $5,000; incorporators, W. A. Arenz, R. LeRoy Herschell, F. J. Wallenberg.

Oak Park, Ill.—Radway Garage Co., capital stock, $6,000; incorporators, J. F. Bambas, H. F. Sinden, C. J. Radway.

Philadelphia, Pa.—Otis Motor Sales Co., capital stock, $10,000; to deal in motor cars; incorporators, E. J. Otis, W. T. Cantwell, T. Harvey.

Portland, Me.—Soule-Smith Co., capital stock, $10,000; to manufacture and deal in motor vehicles; incorporators, W. E. Soule, A. T. Smith.

Richmond, Va.—Auto Lighting Corp., capital stock, $1,500,000; incorporators, A. D. Newcomb, W. Hank, W. J. Simpson, Jr.

Richmond, Va.—National Auto Top Co., capital stock, $15,000; incorporators, G. Crawford, R. V. Merchant, E. R. B. Crawford.

Rock Hill, S. C.—McFadden Auto Co., capital stock, $3,500; incorporators, V. B. McFadden, D. B. McFadden.

Rockford, Ill.—Rockford Motor Truck Co., capital stock, $10,000; to manufacture electric and gasoline motors; incorporators, P. A. Peterson, L. Faust, J. Ledin.

St. Louis, Mo.—Cadillac Automobile Co., capital stock, $50,000; to conduct motor car business; incorporators, J. B. Mogown, J. G. McNieve, F. E. McCord.

St. Louis, Mo.—Auto Products Co., capital stock, $25,000; to deal in general supplies; incorporators, W. W. Smoot, E. B. Stinde.

St. Matthews, Ga.—Calhoun Carage, capital stock, $3,000; incorporators, C. H. Culle, N. E. Salley, J. M. Salley.

Washington, D. C.—Pneucar Co., capital stock, $500,000; to manufacture and deal in motor cars.